

Using a Clamp-on Tester to Test Ground Resistance

IMPORTANT! In order to successfully test grounding with a clamp-on ground resistance tester, such as AEMC's model 6417, the grounding points you are testing require a connection to the utility neutral or other grounding system. When testing grounding electrodes on the two-wire path of a Baseline irrigation controller, you must perform the following procedure carefully in order to obtain an accurate earth-to-ground resistance measurement.

Powering Down the Irrigation Controller

1. Halt all watering while you test the ground resistance on the two-wire path.
 - BaseStation 1000: Press the **OFF** button.
 - BaseStation 3200: Turn the dial to the **OFF** position.
2. Disconnect power from the controller.
 - a. Open the internal door of the BaseStation enclosure.
 - b. Remove the two screws that secure the black plastic cover over the controller PCA board. Put the cover and the screws in a dust free location. (See Figure 1.)
 - c. Find the orange power connector on the wires coming from the transformer. Gently pull the connector away from the board to disconnect the power. (See Figure 2.)
3. Prepare the AEMC Clamp-On Ground Tester Model 6417 for use. (See the procedure on page 3 of this document).

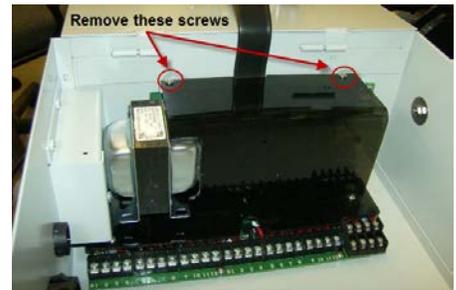


Figure 1

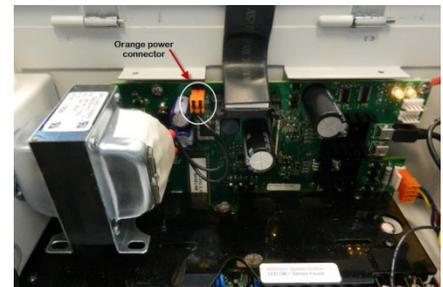


Figure 2

Testing the Enclosure's System Ground

1. Locate the controller chassis ground, and then clamp on the grounding wire connected to the controller enclosure's ground lug. (See Figure 3.) Observe and record the reading. The reading should be 10 ohms or less and must not be indicating "LOOP".
2. Remove the Clamp-On Ground Tester from the chassis wire and re-clamp on the calibration loop. Re-verify the 5.0 reading to validate the chassis wire reading.



Figure 3

Testing the Ground Electrodes on the Two-Wire System

1. Inside the controller enclosure, disconnect the two-wire path from the terminal boards, and then use a wire nut to short the RED to BLACK wires of the two-wire system. If you have more than one two-wire leg, you must short each leg separately.
2. Use an alligator clip to connect the shorted wires to the ground lug. (See Figure 4.) Alternatively, you can add a separate wire to the wire nut, and then screw that wire into the ground lug.
3. At each arrestor location where a **ground resistance test** is needed, short the RED and BLACK wires of the two-wire system that are coming from the irrigation controller.
4. Prepare the instrument for use (see page 3). Clamp around the BLACK wire of the two-wire system on the side of the short toward the controller. Divide the reading by 2 and record the result as the “Two-Wire Loop Resistance”. If the Instrument displays “OR”, try clamping on the other side of the shorting point and see if a low reading is observed. If both sides show “OR”, you might not be clamped on the same two-wire system as the controller where you shorted RED and BLACK in Step 3 above.
5. After a valid “Two-Wire Loop Resistance” has been recorded in Step 4 above, use an alligator clip (or separate wire) to short the bare copper wire coming from the grounding electrode to the RED/BLACK junction created in step 3. Clamp the Ground Tester around the wire going to the grounding electrode connected to the GREEN wire. Record the reading. Remove the Ground Tester from the wire and re-clamp on the calibration loop. Re-verify the 5.0 reading to validate the ground rod reading.
6. Subtract the value you recorded in Step 4 above from the bare copper wire reading and record this value as the “Arrestor's Ground Resistance.” A reading of 5 to 10 ohms is desirable, and a reading of no more than 25 ohms is required.
7. Remove the shorts installed in steps 3 and 5, and then reconnect the two-wire with new 3M™ DBR/Y-6 or equivalent connectors.
8. Repeat steps 3 through 6 at each arrestor where a ground test is needed.
9. When all arrestors have been tested, remove the shorting jumpers installed in step 2, and then reconnect the two-wire inside the controller’s enclosure.
10. Power up the controller by reattaching the orange power connector to the board.
11. Replace the black plastic cover over the controller PCA board.
12. Return the controller to Run.
 - BaseStation 1000: Press the **RUN** button.
 - BaseStation 3200: Turn the dial to the **RUN** position.

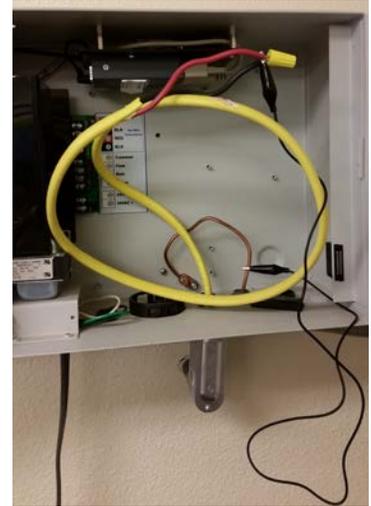


Figure 4

Preparing the AEMC Clamp-On Ground Tester for Use

1. Rotate the selector on the AEMC Clamp-On Ground Tester (Model 6417) to the Ohms/Amps position and wait for Cal to be completed. The instrument should read "OR" and a faint beep should be heard.
2. Clamp the Ground Tester on to the calibration loop provided with the instrument and verify that the instrument reads 5.0 ohms (+ or – 0.5 ohms) while clamped on the calibration loop.



3. If you do not read 5 ohms, clean the heads of the Clamp-On Ground Tester and repeat from step 1 above.
4. If 5.0 ohms (+ or – 0.5 ohms) is displayed, remove the Clamp-On Ground Tester from the calibration loop. The instrument is now ready to be used to perform a ground resistance test.