AEMC INSTRUMENTS 6416 Clamp Ground Resistance Tester User Guide

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AEMC INSTRUMENTS 6416 Clamp Ground Resistance Tester

Specifications

- **Models:** 6416/6417/6418
- **Measurement Type**: Clamp-On Ground Resistance Tester
- **Operating Modes:** Current Mode, Resistance Mode
- **Display:** Digital display
- **Manufacturer Contact:** Technical Assistance [800-343-1391]
- **Website:** [www.aemc.com]

Product Instruction

1. Turn the instrument on by rotating the selector knobto the “Ω+A” position.
2. Allow the instrument to boot up and begin beeping with 0. R.Ω displayed on the screen. To check calibration, locate the 5Ω calibration loop supplied with the tester and clamp the meter around it.
3. Observe the the instrument rea. Itd be within 0.2Ω of the calibration loop specification (5Ω). If the adding is correct, price ed to step 5.
4. If not, clean the instrument and repeat steps 3 and 4. If you are not able to get the instrument to read within 0.2Ω after cleaning it, do not proceed. Have the instruments been repaired?
5. Remove the instrument from the calibration loop. Observe instrument reading with nothing in the clamps. The reading should be 0.R.Ω. If this condition is observed, continue to step 6. If not, clean the instrument (see instructions below) and repeat steps 3 through
6. If, after cleaning the instrument, you are still unable to get the instrument to perform as described in steps 4 and 5, open the jaws approximately ½ inch and let them snap shut. Make sure that the jaws close properly. If the unit still does not perform properly, do not proceed. Have the instruments repaired?

7. Switch the instrument to Current Mode (rotate the selector switch to the “A” position for Amps).
8. Clamp the instrument around the ground wire or rod.
9. Observe reading – if less than 1.0A, proceed to step 9. If between 1.0 and 10A, make note of the reading and continue to step 9. If greater than 10A, terminate the test remove an instrument from the ground wire or rod, and investigate and address the reason for the high leakage current before re-testing.
10. Switch the instrument to Resistance (Ω+A) mode (rotate the selector switch to the “Ω+A” position).
11. Wait for the reading to stabilize and record the reading. Lock the reading on the display by pressing “HOLD.”
12. Remove the instrument from the ground wire or rod and re-clamp to the calibration loop.
13. Observe reading – the reading should be within 0.2Ω of the calibration loop value. If the reading is OK – the measurement is valid. If the reading is wrong, clean the instrument (see instructions below) and repeat from step 4.

Cleaning the Heads

To ensure optimum performance, it is important to keep the probe jaw mating surfaces clean at all times. Failure to do so may result in erroneous readings. To clean the probe jaws, use a lint-free cloth or, if the jaws are pitted, use very fine sandpaper (600 grit) to avoid scratching the surface, then gently clean with a soft cloth. Make sure that the instrument is oriented such that no debris or filings will fall into the unit while cleaning. Check with your finger afterward to be sure that no foreign material remains on the jaw surfaces (both top and bottom).

Clamp-On Ground Resistance Testing

The clamp-on ground resistance testing technique offers the ability to measure the resistance without disconnecting the ground. This type of measurement also offers the advantage of including the bonding to the ground and the overall grounding connection resistances.

Principles of Operation

Usually, a common distribution line grounded system can be simulated as a simple basic circuit as shown in Figure A, or an equivalent circuit, as shown in Figure B. If voltage E is applied to any measured grounding system. Rx through a special transformer, current I flow through the circuit. Therefore, E/I = Rx is established. If it is detected with E kept constant, measured grounding resistance can be obtained. Refer again to Figures A and B. Current is fed to a special transformer via a power amplifier from a 2083 Hz constant voltage oscillator.

This current is detected by a detection CT. Only the 2083 Hz signal frequency is amplified by a filter amplifier. This occurs before the A/D conversion and after synchronous rectification. It is then displayed on the screen of the meter.
The filter amplifier is used to cut off both earth current at a commercial frequency and high-frequency noise. Voltage is detected by coils wound around the injection CT, which is then amplified, rectified, and compared by a level comparator. If the clamp is not closed properly, an “open jaw” annunciator appears on the display.

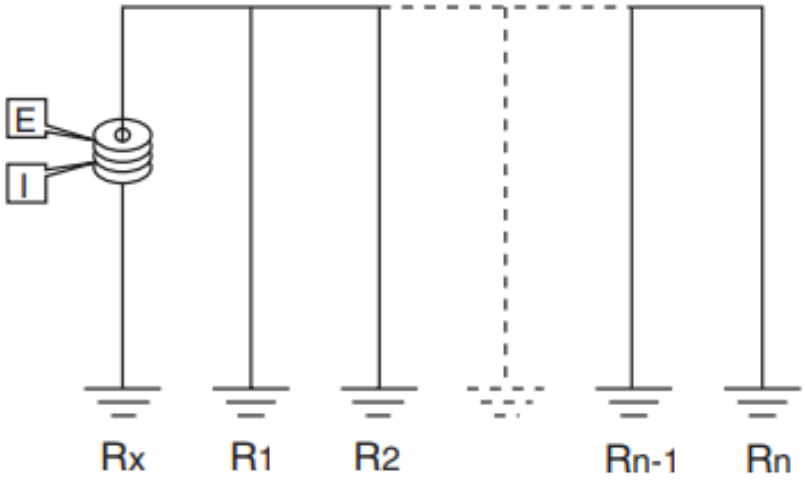

FIGURE A

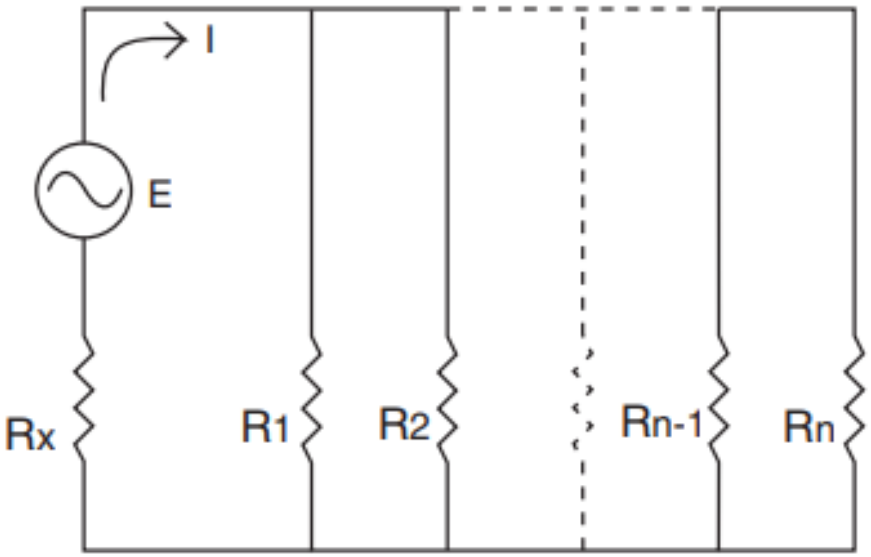

FIGURE B

The important points to consider for proper use of the clamp-on ground tester are:

1. There is a series-parallel resistance path downstream from the measurement point that is lower in resistance than the point being measured.
2. The earth is the return path to the point where the clamp-on meter is connected and not wire or other metal structures (see Figure C).
3. If the measurement point is not connected to a series-parallel low-resistance network (such as the case with a single rod), a temporary path may be created by connecting a jumper cable from the measurement point to a low resistance like a pole ground (see Figure D).

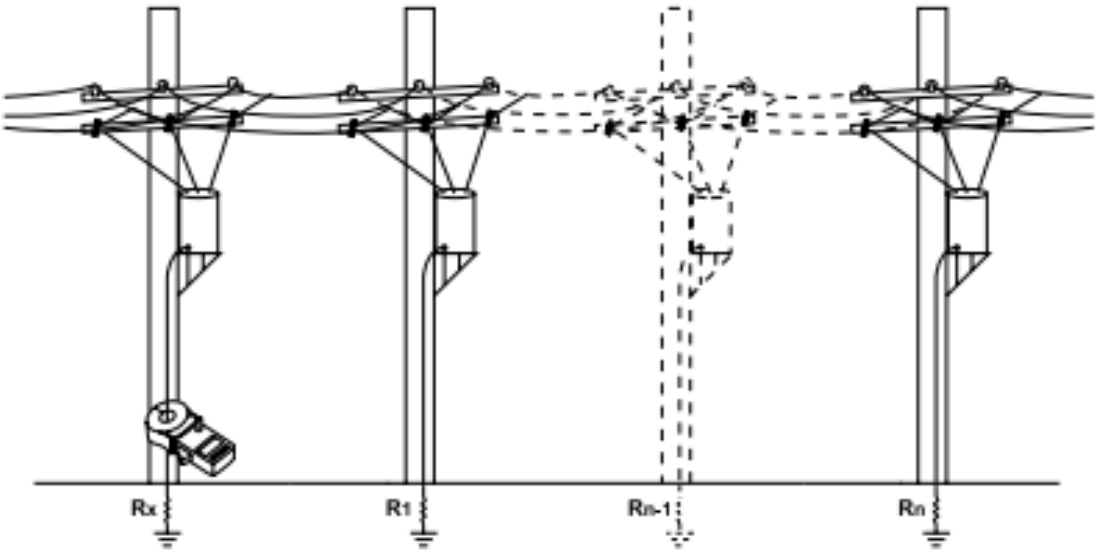

FIGURE C

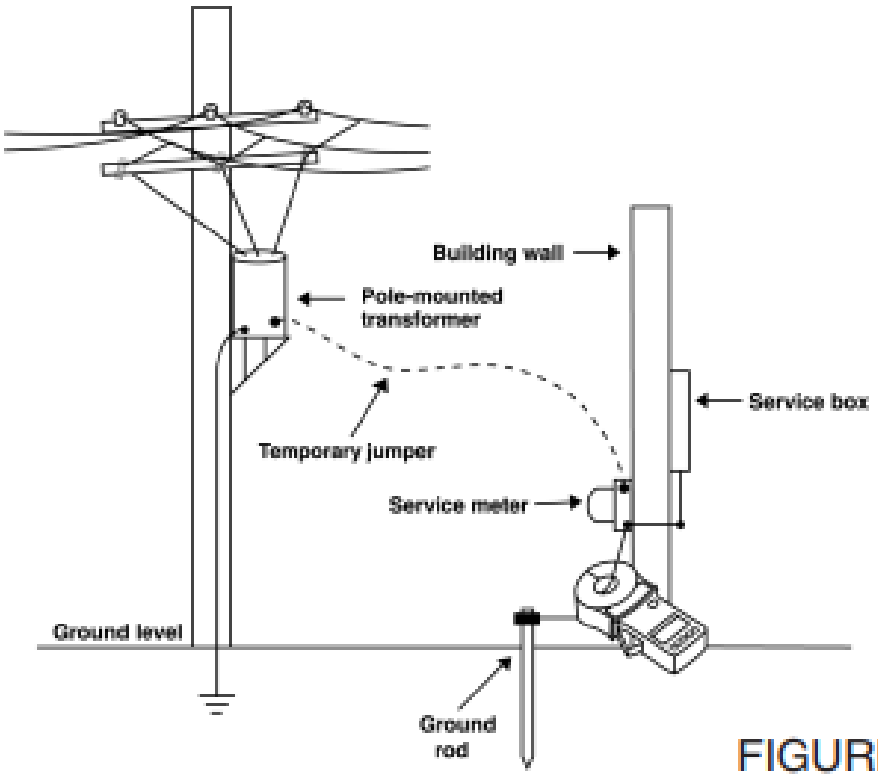

FIGURE D

Interpretation of Readings

Interpretation of Readings:	
0.00 – 1.0	Local “Ground Loop” is most likely present. Also indicates the conductor is bonded to other electric paths. This reading cannot be used to judge the quality of the path to Earth. The message LOOP will also flash on the screen.
1.0 – 5.0	Most likely a Local Ground Loop but also indicates a VERY good ground path to Earth.
5.0 – 25	Ground Resistance Value of a single local rod. A higher reading might indicate a poor BOND is also p resent.
25 – OL	Readings in this range are an indication of a POOR path to Earth AND/OR a VERY POOR bond. OL indicates the lack of any bond to Earth.

FAQs

Q: How often should I calibrate the instrument?
A: It is recommended to calibrate the instrument regularly as per the user manual instructions or if you notice any discrepancies in readings.

Q: Can I use the clamp-on ground resistance tester on live wires?
A: No, it is not safe to use the tester on live wires. Ensure all power sources are turned off before measurements.

Documents / Resources

	AEMC INSTRUMENTS 6416 Clamp Ground Resistance Tester [pdf] User Guide 6416, 6417, 6418, 6416 Clamp Ground Resistance Tester, 6416, Clamp Ground Resistance Tester, Ground Resistance Tester, Resistance Tester, Tester

References

- Get Electrical Testers – Power Analyzers | AEMC Instruments
- User Manual