**Solar Electric Technician (Level 2)**

**Module 3: Measurement of electrical and solar parameter**

**E8: Assignment-Performing continuity test**

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| **E8: ASSIGNMENT MEMO** | |
| **Date** | …. |
| **To** | Participants |
| **From** | Trainers |
| **Subject** | Performing continuity test. |
| **What** | Study the given instructions and of perform the continuity test for the given load. |
| **Why** | The objective of the assignment is to carry out the continuity test to ensure/verify proper connections and ensure the functionality of the system. |
| **How** | 1. Work in group of 2 or 4. 2. Gather the required tools and equipment. 3. Read and carefully follow the instructions to conduct continuity test for each task given. 4. Record the findings, measured values, and any observations during the test. 5. Some tasks are provided with notes to assist participants for tallying the measured value or results. 6. After completing the assigned tasks, discuss your results within the class and answer any related questions. |
| **Time** | 60’ |

**Task 1: Perform a continuity test of on the wiring between solar panels and inverter to ensure there are no breakages.**

1. **Required tools/equipment**

* Solar panels system wiring
* Multimeter

1. **Instructions**

* Disconnect the solar panel from the inverter and make sure the system is not live.
* Set the multimeter to continuity mode.
* Place one lead of the multimeter at one end of the wire at the solar panel terminal.
* Place the other lead at the corresponding wire connection at the inverter.
* If the multimeter beeps, the wiring is intact. If there is no sound, the wire may be damaged or broken.

**Task 2: Perform continuity test on fuses in solar panel combiner box to verify it is functioning properly.**

1. **Required tools/equipment**

* Solar panels combiner box with fuses.
* Multimeter

1. **Instructions**

* Ensure the combiner box is de-energized and disconnected from the main power.
* Remove the fuse from the combiner box.
* Set the multimeter to continuity mode.
* Place one lead of the multimeter on one end of the fuse and the other lead on the opposite end.
* A beep indicates the fuse is good, while no sound means the fuse is blown and needs replacement.

1. **Notes**

* A role of fuses is to protect the solar array from overcurrent conditions.

**Task 3: Perform continuity test on grounding of solar PV system to ensure that the system is properly grounded to protect against electrical faults.**

1. **Required tools/equipment**

* Solar PV system grounding
* Multimeter

1. **Instructions**

* Disconnect the system from the inverter and ensure it is de-energized.
* Set the multimeter to continuity mode.
* Place one lead of the multimeter on the solar panel frame and the other lead on the ground rod.
* If the multimeter beeps, the grounding is correctly installed. If not, check for loose or corroded connections.

1. **Notes**

* The importance of proper grounding is to prevent the electrical hazards.

**Task 4: Perform continuity test on junction box wire connections.**

1. **Required tools/equipment**

* Junction box
* Multimeter

1. **Instructions**

* Ensure the system is powered off.
* Open the junction box and set the multimeter to continuity mode.
* Test the continuity of each wire by placing the leads on both ends of the wires inside the junction box.
* If the multimeter beeps, the connection is solid; if not, the wire may be damaged or improperly connected.

1. **Notes**

* To understand how the poor connections in junction boxes can lead to system inefficiency or failure.

**Task 5: Perform continuity test of solar panel diodes to ensure the protection against shading issues.**

1. **Required tools/equipment**

* Solar panels
* Multimeter

1. **Instruction**

* Disconnect the solar panel from the system.
* Set the multimeter to diode testing mode or continuity mode.
* Place the leads of the multimeter across the terminals of the diode (anode and cathode).
* In one direction, the multimeter should beep, indicating forward bias;   
  in the opposite direction, there should be no beep, indicating reverse bias.

1. **Notes**

* The role of bypass diode is to maintain solar panel efficiency when partial shading occurs.

**Task 6: Perform continuity test of solar array to inverter to verify the integrity of the connection.**

1. **Required tools/equipment**

* Solar panels and Inverter wiring
* Multimeter

1. **Instructions**

* Ensure the system is de-energized and disconnected.
* Set the multimeter to continuity mode.
* Place one lead on the positive terminal of the solar array and the corresponding terminal on the inverter.
* Repeat the process for the negative terminal.
* A beep indicates a proper connection; otherwise, the wiring may need repair or replacement.

1. **Notes**

* The exercise discusses the impact of faulty connections on energy production efficiency and inverter performance.