**Solar Electric Technician (Level 2)**

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

**E11: Assignment - Single and three phase wire connection**

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| **E11: ASSIGNMENT MEMO** | |
| **Date** | …. |
| **To** | Participants |
| **From** | Trainers |
| **Subject** | Perform and understand single and three-phase wire connection. |
| **What** | Study the wire connections for single and three-phase system. |
| **Why** | The objective of the assignment is to gain clear understanding of the wiring systems for both single-phase and three-phase connections. |
| **How** | 1. Work in groups of 2 or 4 2. Gather the required tools and equipment. 3. Read and carefully follow the instructions for each assigned task given. 4. Record the findings, measured values, and any observations during the test. 5. Some tasks include 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: Wiring a single-phase solar PV system connected to a load.**

1. **Required tools/equipment**

* Solar panel (1kWp)
* Single phase solar inverter
* DC disconnect switch
* AC disconnect switch
* Battery (optional)
* Load (light bulbs, small appliances)
* Fuses and breakers
* Wires

1. **Instruction**

* Connect solar panels to the input terminals of charge controller or directly to inverter.
* From inverter, wire AC output to AC disconnect switch.
* Connect AC disconnect switch to load.
* Ensure all wiring is correctly fused with appropriate overcurrent protection devices.
* Test the system by switching on inverter and ensure the load is powered.

**Task 2: Wiring three-phase solar PV system to balance the load.**

1. **Required tools/equipment**

* Solar panel (3kWp)
* Three phase solar inverter
* DC disconnect switch
* AC disconnect switch (three-phase)
* Fuses and breakers
* Wires

1. **Instruction**

* Connect solar panels to the three-phase inverter input (ensure correct polarity and wiring configuration).
* From the inverter, wire the three-phase AC output (L1, L2, L3, and neutral) to the three-phase AC disconnect switch.
* From the AC disconnect, wire the system to the three-phase load (e.g., motor or industrial equipment).
* Verify connections and install appropriate over current protective devices (OCPDs) like three-phase breakers.
* Switch on the system and test the load to ensure a proper power supply.
* Use a multimeter to verify all the connections before powering up.

**Task 3: Testing and balancing a three-phase system.**

1. **Required tools/equipment**

* Solar panel (>= 3kWp)
* Three phase solar inverter
* Three-phase load
* Multimeter
* Clamp meter

1. **Instructions**

* Install the three-phase PV system and connect it to the three-phase load as in task 2.
* Using a multimeter, measure the voltage between each phase (L1-L2, L2-L3, L1-L3) and neutral.
* Using a clamp meter, measure the current on each phase.
* Record and compare the current and voltage for each phase to ensure the system is balanced.
* If the system is unbalanced, adjust the load distribution to achieve balance.

1. **Notes**

* Always wear insulated gloves, safety goggles, and follow lockout/tag-out (LOTO) procedure when working with live circuit.
* Before handling wires, use multimeter to test for live voltage.
* Ensure all systems are grounded to prevent electrical shocks or damage to equipment.