



REPUBLIC OF KENYA

COMPETENCY BASED CURRICULUM

FOR

ELECTRICAL OPERATION (POWER OPTION)

KNQF LEVEL 5

ISCED CODE: 07130554 B



**TVET CDACC
P.O BOX 15745-00100
NAIROBI**

SOLAR SYSTEM INSTALLATION

UNIT CODE: ENG/CU/PO/CR/06/5/B

Relationship to Occupational Standards

This unit addresses the unit of competency: Install Solar System

Duration of Unit: 30 hours

Unit Description

This unit covers the competencies required to install solar system. Competencies includes; mounting solar panel, fixing solar system components, laying cables, terminating electrical and testing of a solar installation system.

Summary of Learning Outcomes

1. Mount solar Panel
2. Fix solar system accessories
3. Lay out Electrical cables
4. Terminate Electrical cables
5. Test and inspect solar system installation

Learning Outcomes, Content and Suggested Assessment Methods

| Learning Outcome | Content | Suggested Assessment Methods |
|-------------------------|--|--|
| 1. Mount Solar panel | <ul style="list-style-type: none">• Meaning of Terms e.g.<ul style="list-style-type: none">✓ Slanting angle✓ Panel Ratings• Solar panel positioning• Types of Solar panels e.g.<ul style="list-style-type: none">✓ PV Solar• Vacuum tube• Monocrystalline• Polycrystalline | <ul style="list-style-type: none">• Observation• Oral questioning• Practical tests• Written tests |

| | | |
|-----------------------------------|--|---|
| | <ul style="list-style-type: none"> Factors to consider in solar panel Selection and installation | |
| 2. Fix solar system components | <ul style="list-style-type: none"> Methods of solar panel connection <ul style="list-style-type: none"> ✓ Parallel and series Solar panel components <ul style="list-style-type: none"> ✓ Charger controller ✓ Inverters ✓ Solar batteries ✓ Cables Types of charge controllers e.g. <ul style="list-style-type: none"> ✓ Pulse width Modulated ✓ Maximum power point tracking. ✓ Simple one or two stage controls | <ul style="list-style-type: none"> Observation Oral questioning Written tests |
| 3. Lay Electrical cables | <ul style="list-style-type: none"> Cable laying tools Cable segregation Cable labelling | <ul style="list-style-type: none"> Observation Oral questioning Practical tests Written tests |
| 4. Terminate Electrical cables | <ul style="list-style-type: none"> Meaning of terms Cable lugging Cable connectors | <ul style="list-style-type: none"> Observation Oral questioning Practical tests Written tests |
| 5. Test Solar system installation | <ul style="list-style-type: none"> Meaning of test Types of tests <ul style="list-style-type: none"> ✓ Insulation resistant test ✓ Short circuit test ✓ Ring circuit test ✓ Continuity test ✓ Earth continuity test ✓ Firmness test | <ul style="list-style-type: none"> Observation Oral questioning Practical tests Written tests |

Suggested Methods of instruction

- Demonstration by trainer
- Practice by the trainee
- Field trips
- On-job-training
- Discussions

Recommended Resources

- Set of screw drivers
- Set of spanners and wrenches
- Power tools
- Cutting tools
- Pliers
- Lifting and tensioning tools
- Tool box
- Phase tester
- PPE –hand gloves, dust coat, dust masks
- Multimeter
- Clamp meter
- Earth electrode resistance meter
- Phase sequence meter
- Stationery
- Cables
- Lubricants
- Service parts