



REPUBLIC OF KENYA

NATIONAL OCCUPATIONAL STANDARDS

FOR

ELECTRICAL INSTALLATION ARTISAN

KNQF LEVEL 4

ISCED OCCUPATIONAL STANDARD CODE:07130454B



TVET CDACC
P.O BOX 15745-00100
NAIROBI

PERFORM ELECTRICAL INSTALLATION TESTING

UNIT CODE: ENG/OS/EI/CR/02/4/B

UNIT DESCRIPTION

This unit covers the competencies required to perform electrical installation testing. It involves carrying out physical inspection, identifying tests to be carried out and the test equipment, performing the tests and issuing certificates.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Carry out physical inspection	1.1 <i>Visual inspection</i> is carried out 1.2 <i>Fitting points</i> and equipment are identified as per as-built drawings 1.3 Physical condition of the installation is checked as per established standards 1.4 Firmness of the installation is checked as per the established standards
2. Identify the test to be carried out and the test equipment	2.1 The <i>installation</i> to be tested is identified per established standards 2.2 Test points are identified as per established standards 2.3 Test parameters and their expected values are identified as per established standards 2.4 Appropriate <i>Test equipment</i> are identified as per the tests to be carried out 2.5 Test equipment are checked for appropriate specifications and functionality 2.6 Test equipment are prepared and stored for safe and easy access in accordance with established procedure
3. Perform the tests	3.1 Test sequence procedure is decided based on the test standards 3.2 Safety precautions are adhered to as per OSHA 3.3 Additional precaution is observed on the installation in hazardous environment as per EHS standard 3.4 <i>Tests</i> are carried out in line with the IEE regulations 3.5 Test results are recorded and compared with standards values

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These describe the key outcomes which make up workplace function.	These are assessable statements which specify the required level of performance for each of the elements <i>(Bold and italicised terms are elaborated in the Range)</i>
	3.6 Test report is compiled and shared with relevant parties
4. Issue installation test results and wiring completion certificates	4.1 Test certificate is issued to the relevant parties 4.2 Wiring certificate is issued to the relevant parties

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance

Variable	Range
1. Installation may include but is not limited to:	<ul style="list-style-type: none"> • Domestic • Agriculture/ horticulture
2. Test equipment may include but is not limited to:	<ul style="list-style-type: none"> • Multimeter/AVO meter • Wattmeter • Insulation resistance tester • Loop impedance tester • Earth resistance tester • Clamp meter • Power quality analyzer • Infrared camera • Phase sequence meter • Frequency meter • Synchroscope • Tachometer • Tacho generator • Laser meter • Lux meter
3. Visual inspection may include but is not limited to:	<ul style="list-style-type: none"> • Check for: • Firmness of accessories/equipment • Loose connections • Damaged equipment/component if any

Variable	Range
	<ul style="list-style-type: none"> • Colour coding
4. Fitting points may include but is not limited to:	<ul style="list-style-type: none"> • Switches • Cables • Socket outlets • Light fittings • Conduits and cable trays • Trunking • Motors • Power generators • Pumps
5. Test parameters may include but is not limited to:	<ul style="list-style-type: none"> • Potential difference between circuits • Power • Resistance • Voltage • Current • Inductance/capacitance • Frequency
6. Tests may include but is not limited to:	<ul style="list-style-type: none"> • Continuity • Insulation resistance • Polarity • Earth electrode resistance • Earth fault loop impedance • Speed

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

Required Skills

The individual needs to demonstrate the following skills:

- Apply basic troubleshooting methods
- Use of basic Electrical instruments
- Perform various unit conversions of Electrical quantities
- Perform Electrical earthing
- Lightning arrestors
- Power factor correction
- Logical thinking

- Problem solving problems
- Drawing graphs
- Using different measuring tools

Required knowledge

The individual needs to demonstrate knowledge of:

- Electrical power calculations
- Various laws in Electrical engineering
- Electrical formulas
- Power triangle
- SI units of various electrical parameters
- Earthing testing
- Lightning arrestor testing
- Selecting the correct type of electrical machines for various uses
- Types and purpose of measuring instruments
- Units of measurement and abbreviations

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Applied and adhered to safety procedures 1.2 Applied the procedures of testing appropriately 1.3 Identified the types of tests to be carried out correctly 1.4 Observed IEE regulations during testing 1.5 Identified test equipment correctly 1.6 Obtained and recorded test values accurately 1.7 Interpreted the recorded test results correctly
2. Resource Implications	<p>Resources the same as that of workplace are advised to be applied including</p> <ul style="list-style-type: none"> 2.1 Electrical installation tool kit 2.2 Multimeter/AVO meter 2.3 Wattmeter 2.4 Insulation resistance tester 2.5 Clamp meter 2.6 Phase sequence meter 2.7 Frequency meter 2.8 Tacho meter

3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Written tests 3.3 Oral questioning 3.4 Portfolio
4. Context of Assessment	Competency may be assessed individually: 4.1 On-the-job, 4.2 Off-the-job or a combination of these. 4.3 During industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.