

REPUBLIC OF



KENYA

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**ELECTRICAL OPERATOR (POWER OPTION)**

**KNQF LEVEL 5**

**ISCED CODE: 07130554 B**



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**NAIROBI**

## INSTALL ELECTRICAL MACHINE

UNIT CODE: ENG/OS/PO/CR/03/5/B

### UNIT DESCRIPTION

This unit covers the competencies required to Install Electrical Machine. Competencies include; mounting electrical machine, mounting machine control panel, laying machine cables, termination of an installation of Electrical machine and testing of Electrical machine installation.

### 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. <b><i>(Bold and italicised terms are elaborated in the Range)</i></b>
1. Mounting Electrical machine	1.1 Machine is mounted as per its size 1.2 Machine is mounted as per its load 1.3 Machine is mounted in line with OSHA 1.4 Machine earthing is performed in line with the IEE regulation
2. Mount Machine control panel	2.1 Control panel is mounted as per the load and functions of the machine 2.2 Components on the control panel are mounted as per standard operating procedure 2.3 <b>Components</b> on the control panel are spaced as per machine rating and environmental conditions 2.4 Components on the control panel are wired as per the design 2.5 Control panel is aesthetically wired as per the standard operating procedure 2.6 Components on the control panel are labelled as per their functions. 2.7 Control panel is enclosed as per the OSHA
3. Lay machine cables	3.1 Machine cables are laid as per the IEE regulations 3.2 Cables laying system is as per the <b>EHS</b> regulations 3.3 Cables are colour coded as per the IEE regulations 3.4 Firmness of the cables are installed as per the standard operating procedure 3.5 Cables are segregated as per the standard operating procedure
4. Terminate Electrical machine Installation	4.1 Cable lugging is performed as per the standards operating procedure. 4.2 Cables are terminated as per the IEE regulations

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	4.3 Cables are terminated in the connector as per the <b><i>load size</i></b>
5. Test Electrical machine installations	<p>5.1 Type of tests are identified</p> <p>5.2 Test is performed as per the IEE regulations</p> <p>5.3 Firmness of the installation is established</p> <p>5.4 Continuity test is performed</p> <p>5.5 Insulation resistance test is performed as per the IEE regulations</p> <p>5.6 Earth test is performed as per the IEE regulations</p> <p>5.7 On load and off load tests are performed</p>

## 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"> <li>• Machine installation</li> <li>• Commercial installation</li> <li>• Industrial Installation</li> <li>• Power Generator</li> <li>• Security</li> <li>• Power transmission and distribution</li> </ul>
2. Load size may include but is not limited to:	<ul style="list-style-type: none"> <li>• 32A</li> <li>• 80A</li> <li>• 100A</li> <li>• 180A</li> </ul>
3. Components may include but is not limited to:	<ul style="list-style-type: none"> <li>• Switches</li> <li>• Circuit breakers</li> <li>• Fuses</li> <li>• Termination blocks</li> </ul>
4. EHS regulation (Environment, Health and Safety) regulation may include but is not limited to:	<ul style="list-style-type: none"> <li>• EMCA 1999 Act</li> <li>• OSHA</li> </ul>

## **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:

- Communications (verbal and written);
- Proficient in logistic management;
- Time management;
- Meeting organization;
- Analytical
- Faults troubleshooting;
- Planning;
- Decision making;
- First aid;
- Report writing;
- Problem solving;
- Management

### **Required knowledge**

- The individual needs to demonstrate the following knowledge:
- The manufacturer's warranty requirements relating to electrical installation systems and related components.
- Legal requirement related to electrical machine installations
- Specification (manuals for the system)
- Legislation and workplace procedures relevant to:
- Health and safety;
- The environment (including waste disposal);
- Appropriate PPEs (personal and protection equipment).
- Workplace procedures for:

#### Recording system installation and maintenance work

- Timely reporting of work.
- The importance of documentation and record keeping
- The importance of time management
- The relationship between time and costs.
- The importance of efficiency
- How to read, interpret and implement drawings for machine installation and maintenance activities
- The importance of using the correct sources of technical information.

## EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Applied and adhered to safety procedures 1.2 Components on the control panel were wired as per the design 1.3 Cable lugging was performed before termination of the machine cables 1.4 Applied appropriate standards 1.5 Machine load size was considered in the design of the machine layout 1.6 Insulation, short circuit and continuity tests were performed after machine installation
2. Resource Implications	<b>The following resources must be provided:</b> 2.1 Installation tools 2.2 Electrical machine to be installed 2.3 Designing tools 2.4 Machine installation site 2.5 Stationery
3. Methods of Assessment	<b>Competency may be assessed through:</b> 3.1 Oral questioning 3.2 Practical demonstration 3.3 Observation
4. Context of Assessment	Competency may be assessed individually in 4.1 The actual workplace or 4.2 Simulated work place environment 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.