



**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**AGRICULTURAL ENGINEERING TECHNICIAN**

**LEVEL 6**

**PROGRAMME ISCED CODE: 0716 454 A**



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

# INSTALL AGRICULTURAL REFRIGERATION AND AIR CONDITIONING SYSTEMS

**UNIT CODE:** 0716 551 25A

**TVET CDACC CODE:** ENG/OS/AGR/CR/03/6/MA

## UNIT DESCRIPTION

This unit specifies the competencies required by an Agricultural Engineering Technologist Level 6 to install agricultural refrigeration and air conditioning systems. It involves designing agricultural refrigeration and air conditioning system, installing agricultural refrigeration and air conditioning system and maintaining agricultural refrigeration and air conditioning systems.

## ELEMENTS AND PERFORMANCE CRITERIA

| <b>ELEMENT</b>  | <b>PERFORMANCE CRITERIA</b>  |
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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.<br><i><b>Bold and italicized terms are elaborated in the Range.</b></i>  |
| 1. Design agricultural refrigeration and air conditioning system  | 1.1 <i>Agricultural refrigeration and air conditioning systems</i> need assessment is performed as per work requirements<br>1.2 Agricultural refrigeration and air conditioning systems work drawings are prepared as per work requirement<br>1.3 Agricultural refrigeration and air conditioning systems design approvals are obtained as per work requirement<br>1.4 Agricultural refrigeration and air conditioning systems bill of quantities are prepared as per designs and drawings |
| 2. Install agricultural refrigeration and air conditioning system | 2.1 Personal protective equipment are worn based on OSHA<br>2.2 <i>Agricultural refrigeration and air conditioning system Tools and equipment</i> are assembled as per work requirements.<br>2.3 Agricultural refrigeration and air conditioning equipment are assembled as per work requirement<br>2.4 Agricultural refrigeration and air conditioning system is installed according to work drawings   |

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|  | 2.5 Agricultural refrigeration and air conditioning systems are tested as per work requirements  |
| 3. Maintain agricultural refrigeration and air conditioning system | <p>3.1 Personal protective equipment are worn based on OSHA</p> <p>3.2 Agricultural refrigeration and air conditioning systems maintenance schedule is prepared as per work requirements</p> <p>3.3 Agricultural refrigeration and air conditioning system tools and equipment are assembled as per work requirement.</p> <p>3.4 Agricultural refrigeration and air conditioning system is maintained as per operator's manual</p> <p>3.5 Refrigeration and air conditioning system is maintained according to manufacturer's manual</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. Agricultural refrigeration and air conditioning systems may include but are not limited to:                    | <ul style="list-style-type: none"> <li>• AC systems</li> <li>• DC systems</li> <li>• Rooftop-mounted air conditioning systems.</li> <li>• Wall mounted air conditioning systems.</li> <li>• Floor-mounted air conditioning systems</li> <li>• Pre-heaters.</li> </ul> |
| 2. Agricultural refrigeration and air conditioning system Tools and equipment may include but are not limited to: | <ul style="list-style-type: none"> <li>• Measuring tools</li> <li>• Screw drivers</li> <li>• Chisel</li> <li>• Hammers (claw and ballpen)</li> <li>• Hacksaws</li> <li>• Files</li> <li>• Grinders</li> </ul>   |

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|  | <ul style="list-style-type: none"> <li>• Electric drills</li> <li>• Drill bits</li> <li>• Testing tools</li> </ul> |
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## **REQUIRED SKILLS AND KNOWLEDGE**

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

### **Required knowledge**

The individual needs to demonstrate knowledge of:

- Computer application packages
- Connecting power circuit
- Design methods
- Different farm tools and materials
- Occupational safety and health procedures

### **Required skills**

The individual needs to demonstrate the following skills:

- Planning
- Technical report writing
- Digital literacy
- Measuring
- Decision making
- Communication skills
- Basic electricity
- Basic masonry
- Basic plumbing

## **EVIDENCE GUIDE**

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

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|-----------------------------------|--|
| 1. Critical aspects of competency | <p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Performed agricultural refrigeration and air conditioning need assessment as per work requirement</li> <li>1.2 Prepared working drawings as per work requirements</li> <li>1.3 Prepared bill of quantities as per approved designs and drawings</li> <li>1.4 Installed agricultural refrigeration and air conditioning system according to working drawings</li> <li>1.5 Tested agricultural refrigeration and air conditioning systems as per work procedure</li> <li>1.6 Prepared maintenance schedule as per agricultural refrigeration and air conditioning system</li> <li>1.7 Maintained agricultural refrigeration and air conditioning system according to manufacturer's manual</li> </ul> |
| 2. Resource implications          | <p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Appropriately simulated environment where assessment can take place</li> <li>2.2 Access to relevant work environment</li> <li>2.3 Resources relevant to the proposed activity or tasks</li> </ul>  |
| 3. Methods of assessment          | <p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Practical's</li> <li>3.2 Projects</li> <li>3.3 Portfolio of Evidence</li> <li>3.4 Third Party Reports</li> <li>3.5 Written tests</li> <li>3.6 Oral assessment</li> </ul>  |
| 4. Context of assessment          | <p>Competency may be assessed:</p> <ul style="list-style-type: none"> <li>4.1 Workplace</li> <li>4.2 Simulated work environment</li> </ul>   |

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| 5. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector and workplace job role is recommended. |
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