



**Australian Government**

**UEENEEG125A Plan electrical installations  
with a low voltage demand up to 400 A per  
phase**

**Release: 2**

## **UEENEEG125A Plan electrical installations with a low voltage demand up to 400 A per phase**

### **Modification History**

Not applicable.

### **Unit Descriptor**

#### **Unit Descriptor**

#### **1) Scope:**

##### **1.1) Descriptor**

This unit covers the planning of circuit and equipment for electrical installations where standardised arrangements for service and CT metering equipment are used, not exceeding 400 A per phase. This encompasses schemes for protection of persons and property, correct functioning, compatibility with the supply, arrangement of circuits, metering and control, cable route planning, specifying type and rating of switchgear, controlgear, protection devices and wiring based on calculated and deemed-to-comply solutions and planning documentation.

### **Application of the Unit**

#### **Application of the Unit 2)**

This unit is intended for competency development entry-level employment based programs incorporated in approved contracts of training. It applies to any formal recognition for this standard at the aligned AQF 4 level or higher.

### **Licensing/Regulatory Information**

#### **License to practice 3)**

The skills and knowledge described in this unit do not require a license to practice in the work place. However practice in this unit is subject to regulations directly

**License to practice**

3)

related to occupational health and safe and contracts of training such as new apprenticeships.

**Pre-Requisites**

**Prerequisite Unit(s)**

4)

**Competencies**

4.1)

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

|                 |                                                                                        |
|-----------------|----------------------------------------------------------------------------------------|
| UEENEEE101<br>A | Apply Occupational Health and Safety regulations, codes and practices in the workplace |
| UEENEEE102<br>A | Fabricate, dismantle, assemble of utilities components                                 |
| UEENEEE104<br>A | Solve problems in d.c circuits                                                         |
| UEENEEE105<br>A | Fix and secure electrotechnology equipment                                             |
| UEENEEE107<br>A | Use drawings, diagrams, schedules, standards, codes and specifications                 |
| UEENEEG006<br>A | Solve problems in single and three phase low voltage machines                          |
| UEENEEG033<br>A | Solve problems in single and three phase electrical apparatus and circuits             |
| UEENEEG063<br>A | Arrange circuits, control and protection for general electrical installations          |
| UEENEEG101<br>A | Solve problems in electromagnetic devices and related circuits                         |
| UEENEEG102<br>A | Solve problems in low voltage a.c. circuit                                             |
| UEENEEG106      | Terminate cables, cords and accessories                                                |

|                             |                                                                                   |
|-----------------------------|-----------------------------------------------------------------------------------|
| <b>Prerequisite Unit(s)</b> | <b>4)</b>                                                                         |
| A                           | for low voltage circuits                                                          |
| UEENEEG107                  | Select wiring systems and cables for low voltage general electrical installations |
| A                           |                                                                                   |

**Literacy and numeracy skills 4.2)**

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 4      Writing 4      Numeracy 4

## **Employability Skills Information**

**Employability Skills 5)**

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

## **Elements and Performance Criteria Pre-Content**

|                                                                                  |                                                                                                                                                                                 |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>6)</b> Elements describe the essential outcomes of a competency standard unit | Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide. |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Elements and Performance Criteria

| <b>ELEMENT</b>                                         | <b>PERFORMANCE CRITERIA</b>                                                                                                                                                  |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 Prepare to plan electrical installations.            | 1.1 OHS risk control measures and procedures for carrying out the work are followed.                                                                                         |
|                                                        | 1.2 The extent and nature of the electrical installation is determined from job specifications.                                                                              |
|                                                        | 1.3 Safety and other regulatory requirements to which the electrical installation shall comply are identified, obtained and understood.                                      |
|                                                        | 1.4 Electricity tariffs required are discussed with appropriate person(s) to ascertain control and metering needs of the installation.                                       |
| 2 Arrange installation circuits, control and metering. | 2.1 Circuits are arranged to ensure safe and functional operation of the installation.                                                                                       |
|                                                        | 2.2 Circuits are arranged to comply with technical standards and job specifications and requirements.                                                                        |
|                                                        | 2.3 Control and metering of the installation is arranged in accordance with regulatory and local requirements and consumer needs.                                            |
|                                                        | 2.4 Earthing is arranged to comply with the standards and local energy supplier's requirements.                                                                              |
| 3 Specify cables, protection and switchgear.           | 3.1 Fault levels at each relevant point of the installation are determined from calculations and/or information from the local energy supplier's.                            |
|                                                        | 3.2 Suitability of the wiring systems selected is determined to meet requirements for protection against environmental factors and job specifications.                       |
|                                                        | 3.3 Cable conductor sizes are determined to meet current-carrying capacity requirements and voltage-drop and fault-loop impedance limitations and short circuit performance. |

**ELEMENT**

**PERFORMANCE CRITERIA**

- |   |                                        |                                                                                                                              |                                                                                                                                                                                                        |
|---|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | 3.4                                    | Protection methods and devices are specified to meet co-ordination requirements for overload and short-circuit protection.   |                                                                                                                                                                                                        |
|   | 3.5                                    | Switchgear and control gear are specified to meet fault levels, current, voltage and IP ratings and functional requirements. |                                                                                                                                                                                                        |
|   | 3.6                                    | Earthing system components are specified to meet requirements of the earthing system used.                                   |                                                                                                                                                                                                        |
|   | 3.7                                    | Evidence is obtained that electrical equipment selected complies with safety requirements.                                   |                                                                                                                                                                                                        |
| 4 | Document electrical installation plan. | 4.1                                                                                                                          | Equipment specified for the installation is documented together with supporting calculations in accordance with established procedures.                                                                |
|   |                                        | 4.2                                                                                                                          | Electrical installation arrangement, equipment locations, cable routes and schedules and requirements are documented in accordance with established procedures and forwarded to appropriate person(s). |

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

8) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and planning electrical installations with a LV demand up to 400 A per phase.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

#### KS01-EG125A

#### Planning electrical installations – 400 A

Evidence shall show an understanding of planning a low voltage electrical installation with demand of up to 400 amps per phase to an extent indicated by the following aspects:

T1 Electrical metering arrangements encompassing:

- Purpose, types and applications.
- Metering equipment.
- Arrangements for metering

## Evidence Guide

### EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

The Evidence Guide forms an integral part of this unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

### Overview of Assessment 9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is

recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects of evidence required to demonstrate competency in this unit 9.2)**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines – UEE11'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
  - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range



statement

- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
  - Plan electrical installations with a LV demand up to 400 A per phase as described in 8) and including:

A Arranging electrical installations to comply with control, metering, safety and other regulatory and functional requirements.

B Specifying appropriate type and size of cables.

C Specifying protection methods and devices that meet co-ordination requirements for overload and short-circuit protection.

D Specifying switchgear and control gear that meet fault level, current, voltage and IP ratings and functional requirements.

E Selecting appropriate earthing system components.

F Documenting installation plan, specifications of equipment, equipment locations, cable routes and schedules and supporting calculations.

G Arranging electrical installations to comply with control, metering, safety and other regulatory and functional requirements.

**Context of and specific resources for assessment** 9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

OHS policy and work procedures and instructions.

Suitable work environment, facilities, equipment and materials to

undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to planning electrical installations with a LV demand up to 400 A per phase.

#### **Method of assessment**

#### **9.4)**

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the industry to which this unit applies. This requires assessment in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

#### **Concurrent assessment and relationship with other units**

#### **9.5)**

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEEED10 Use computer applications relevant to a workplace  
1A

## Range Statement

### RANGE STATEMENT

**10)** This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit shall be demonstrated in relation to planning electrical installations with a LV demand up to 400 A per phase. The installation shall comprise a main switchboard CT metering, multiple tariffs or tenants, distribution boards single and three phase final sub circuits.

The electrical installations shall comprise consumers' mains, main earthing system and main switchboard and sub-mains, earthing system and distribution boards, final sub circuits and requirement particular to the installation type.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

### Unit Sector(s)

Not applicable.

### Competency Field

|                         |            |
|-------------------------|------------|
| <b>Competency Field</b> | <b>11)</b> |
|                         | Electrical |