



Australian Government

UEEEL0037 Design electrical installations with a low voltage demand greater than 400 A per phase

Release: 2

UEEEL0037 Design electrical installations with a low voltage demand greater than 400 A per phase

Modification History

Release 2. Minor Change. Typographic error in prerequisites corrected.

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to design electrical installations with a low voltage (LV) demand greater than 400 ampere (A) per phase.

It includes preparing and developing designing schemes for the protection of persons and property, correct functioning, compatibility with the supply and arrangement of circuits. It also includes determination of fault levels, effective switchgear, control gear, and protection against over-current and over and under-voltage and wiring based on calculations to meet required safety and performance standards and functional requirements.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEECD0019 Fabricate, assemble and dismantle utilities industry components

UEECD0020 Fix and secure electrotechnology equipment

UEECD0051 Use drawings, diagrams, schedules, standards, codes and specifications

UEEEL0003 Arrange circuits, control and protection for general electrical installations

UEEEL0020 Solve problems in low voltage a.c. circuits

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

UEEEL0018 Select wiring systems and cables for low voltage general electrical installations

UEEEL0057 Plan electrical installations with a low voltage demand up to 400 A per phase

UEEEL0019 Solve problems in direct current (d.c.) machines

UEEEL0021 Solve problems in electromagnetic devices

UEEEL0008 Evaluate and modify low voltage heating equipment and controls

UEEEL0009 Evaluate and modify low voltage lighting circuits, equipment and controls

UEEEL0010 Evaluate and modify low voltage socket outlets circuits

UEEEL0024 Test and connect alternating current (a.c.) rotating machines

UEEEL0025 Test and connect transformers

and

UEECD0043 Solve problems in direct current circuits

or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits

Competency Field

Electrical

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Prepare to design electrical installations

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) processes and workplace procedures for a given work area are identified, obtained and applied
- 1.2** Scope of the electrical installation is identified from design brief
- 1.3** Electrical installation safety and regulatory requirements are identified, obtained and applied
- 1.4** Design development work is planned in consultation with relevant person/s involved with the work to meet scheduled timelines

2 Develop installation design

- 2.1** Relevant electrical installation performance standards, compliance methods and electrical equipment is applied to installation design in accordance with relevant industry standards
- 2.2** Alternative installation design/s is developed in

		accordance with the design brief
	2.3	Safety, functional and budgetary considerations are incorporated in installation design
	2.4	Installation design draft is checked in accordance with design brief and relevant industry standards
	2.5	Installation design is documented for submission to relevant person/s for acceptance and approval
	2.6	Unplanned situations are dealt with in accordance with workplace procedures
3	Obtain approval for installation design	
	3.1	Installation design is documented and presented to client representative and/or relevant person/s
	3.2	Requests for alterations to the design are negotiated with relevant person/s in accordance with workplace procedures
	3.3	Final design is documented and approval obtained from relevant person/s
	3.4	Quality of work is monitored in accordance with workplace procedures and relevant industry standards

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Designing electrical installations with a LV demand in excess of 400 A per phase switchboard design installation must include at least the following:

- main switchboard
- multiple tenancies
- distribution boards
- single and three phase final sub-circuits

Unit Mapping Information

This unit replaces and is equivalent to UEENEEG127A Design electrical installations with a low voltage demand greater than 400 A per phase.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEL0037 Design electrical installations with a low voltage demand greater than 400 A per phase

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- developing outlines of alternative designs
- developing the design within the safety and functional requirements and budget limitations
- documenting and presenting design effectively
- successfully negotiating design alteration requests
- obtaining approval for final design
- dealing with unplanned events
- applying performance standards, compliance methods and lighting equipment to installation design
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including using risk control measures
- consulting with relevant person/s in planning design work
- identifying the scope of the installation design brief
- monitoring quality of work
- planning to meet scheduled timelines
- preparing to design electrical installations.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- low voltage (LV) electrical installations with a demand greater than 400 ampere (A) per phase and advanced methods of cable and protection selection, including:
 - electrical installations, determination of demand encompassing:
 - acceptable methods for determining demand in mains and sub-mains
 - applying calculation and assessment methods of determining demand in mains and

sub-mains

- electrical installations, over-current protection encompassing:
 - application of acceptable methods for determining prospective fault current
 - relationship between prospective fault current and characteristics of protective devices
 - relationship between over-current protections at various points in an electrical distribution system
- electrical installations, over-voltage and under-voltage protection encompassing:
 - application of acceptable methods for determining the need for over-voltage and under-voltage protection
 - methods and devices providing over-voltage and under-voltage protection
- problem-solving techniques
- relevant manufacturer specifications and operating instructions
- relevant job safety assessments or risk mitigation processes
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace quality, instructions, policies and procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or simulations
- relevant and appropriate materials, tools, facilities and equipment currently used in industry
- resources that reflect current industry practices in relation to designing electrical installations with a LV demand greater than 400 A per phase.
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>