



Australian Government

UEEEL0020 Solve problems in low voltage a.c. circuits

Release: 2

UEEEL0020 Solve problems in low voltage a.c. circuits

Modification History

Release 2. This is the second release of this unit of competency in the UEE Electrotechnology Training Package.

Assessor requirements updated in Assessment Conditions.

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 ascertain correct operation of single and three phase alternating current (a.c.) circuits and solving circuit problems as they apply to servicing, fault finding, installation and compliance work functions.

It includes safe working practices, multi-phase circuit arrangements, issues related to fault protection, power factor and multiple earthed neutral (MEN) systems and solutions to circuit problems derived from calculated and measured parameters.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) a.c. or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, a relevant contract of training, such as an Australian Apprenticeship, may be required.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Pre-requisite Unit

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

UEEEL0021 Solve problems in magnetic and electromagnetic devices

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

Elements describe the essential outcomes.

1 Identify low voltage (LV) a.c. circuit problem

2 Solve LV a.c. circuit problems

PERFORMANCE CRITERIA

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

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| <p>1.1 WHS/OHS requirements and workplace procedures for work area are identified and applied</p> <p>1.2 Hazards are identified, risks are assessed and control measures and workplace procedures are implemented</p> <p>1.3 Safety hazards which have not previously been identified are noted on job safety assessments and existing risk control measures are implemented</p> <p>1.4 Circuit problems are identified from documentation or work supervisor to determine the scope of work</p> <p>1.5 Advice is sought from the work supervisor to ensure work is coordinated effectively with others</p> <p>1.6 Sources of materials required for work are identified in accordance with workplace procedures</p> <p>1.7 Tools, equipment and testing devices to carry out work are obtained and checked for correct operation and safety</p> | <p>2.1 WHS/OHS risk control measures and workplace procedures for carrying out work are followed</p> <p>2.2 Need to test or measure live work is determined in accordance with WHS/OHS requirements and, as required, conducted in accordance with workplace safety procedures</p> <p>2.3 Circuits/machines/plant are checked and isolated, as required, in accordance with WHS/OHS requirements</p> |
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and workplace procedures

- 2.4 Methodical techniques are used to resolve circuit problems from measured and calculated values as they apply to single and three phase LV circuits in accordance with workplace procedures
 - 2.5 Existing circuits are altered to comply with power factor correction in compliance with industry standards
 - 2.6 Power factor of a circuit is calculated from given measurements
 - 2.7 Low power factor is improved by altering the reactive power of a circuit
 - 2.8 Unplanned situations are responded to in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
 - 2.9 Problems are resolved without damage to apparatus, circuits, the surrounding environment or services using sustainable energy practices
- 3 Complete work and document activities**
- 3.1 WHS/OHS work completion risk control measures and workplace procedures are followed
 - 3.2 Worksite is cleaned and made safe in accordance with workplace procedures
 - 3.3 Justification for solutions used to resolve circuit problems is documented in accordance with workplace procedures
 - 3.4 Work completion is documented and an appropriate person/s notified in accordance with workplace procedures

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.

Solving problems in a.c. circuits must include:

- determining the operating parameters of existing circuits
- altering an existing circuit to comply with specified operating parameters
- developing circuits to comply with a specified function and operating parameters of voltage, current, impedance, power and power factor
- determining the cause of low power factor in an existing circuit
- determining conditions causing an existing circuit to be unsafe, including electric shock hazard from indirect contact with conductive parts.

Solving problems in single phase circuits must include:

- connecting single phase circuits
- choosing correct instruments
- taking measurements correctly and accurately.

Solving problems in three phase circuits must include:

- connecting three phase circuits
- choosing correct instruments
- taking measurements correctly and accurately.

Solving problems in LV a.c. circuits must include at least four of the following applications:

- series a.c. circuits
- parallel a.c. circuits
- series/parallel a.c. circuits
- single phase motors/controls
- three phase motors/controls
- synchronous machines
- transformers/auxiliary components
- star connected circuits
- delta connected circuits
- star-delta interconnected circuits
- open delta circuits.

Unit Mapping Information

This unit replaces and is equivalent to UEENEEG102A Solve problems in low voltage a.c. circuits.

Links

Companion Volume Implementation Guides are found in VETNet -

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