



Australian Government

UEEEEC0075 Troubleshoot single phase input d.c power supplies

Release: 1

UEEEEC0075 Troubleshoot single phase input d.c power supplies

Modification History

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 determine the correct operation of independent power supplies and power supply sections of electronic apparatus.

It includes troubleshooting and applying problem-solving procedures; working safely; using voltage, current and resistance measuring devices to measure and calculate; and providing solutions to predictable problems in direct current (d.c.) power supplies with single phase inputs.

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

UEEEEC0060 Repairs basic electronic apparatus faults by replacement of components
and

UEECD0043 Solve problems in direct current circuits
or

UEECD0044 Solve problems in multiple path circuits

UEECD0046 Solve problems in single path circuits
and

UEEEEC0074 Troubleshoot resonance circuits in an electronic apparatus
OR

UEECD0045 Solve problems in multiple path extra-low voltage (ELV) a.c. circuits
OR

UEEEEC0065 Solve problems in basic electronic circuits
OR

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

UEEEL0021 Solve problems in magnetic and electromagnetic devices

UEEEL0020 Solve problems in low voltage a.c. circuits

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

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

1 Troubleshoot d.c. power supplies	1.1	Work health and safety (WHS)/occupational health and safety (OHS) procedures for a given work area are obtained and applied
	1.2	Nature of d.c. power supplies fault is obtained from documentation or from work supervisor to determine the scope of work to be undertaken
	1.3	Advice is sought from work supervisor to ensure work is coordinated effectively with others
	1.4	Materials required for the work are determined in accordance with workplace procedures
	1.5	Tools, equipment and testing devices required to carry out the work are obtained in accordance with workplace procedures and checked for correct operation and safety
2 Solve d.c. power supply problems	2.1	WHS/OHS risk control work measures and workplace procedures are followed
	2.2	Power supply fault finding is approached methodically in accordance with workplace procedures, drawing on knowledge of d.c. power supplies and using measured and calculated values of parameters
	2.3	Fault-finding activities are carried out efficiently without unnecessary waste of materials or damage to apparatus, the surrounding environment or services using sustainable energy practices
3 Complete work and document problem-solving	3.1	WHS/OHS risk control measures and workplace

activities

procedures for work completion are followed

- 3.2** Worksite is cleaned and made safe in accordance with workplace procedures
- 3.3** Justification for solutions used to resolve single phase input d.c. power supply problems are documented in accordance with workplace procedures
- 3.4** Work completion is documented and 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.

Troubleshooting d.c. power supply problems must include:

- single phase input on the rectification section
- filtering section of a half wave and full wave rectifiers

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH111A Troubleshoot single phase input d.c power supplies.

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 UEEEC0075 Troubleshoot single phase input d.c power supplies

Modification History

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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 two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - using risk control measures
- checking tools, materials, equipment and testing devices for correct operation and safety
- testing or measuring on live and operating system safely
- ensuring circuits are isolated
- communicating effectively with relevant stakeholders
- completing work and required documentation
- maintaining a clean worksite and equipment
- referring to relevant documentation to determine the fault
- solving direct current (d.c.) power supply problems
- troubleshooting d.c. power supplies with single phase input, including:
 - using methodical problem-solving methods
 - providing written justification for the solutions to d.c. power supplies problems
 - dealing with unplanned events in accordance with workplace procedures
 - taking measurements correctly and accurately
 - calculating parameters correctly and accurately
 - providing solution to power supply problems.

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:

- power supplies operating principles and applications, including:
 - block diagram identifying each sub-system
 - constant voltage and current

- expected waveforms in a power supply
- power supply function
- d.c. rectification circuits, including:
 - dual rail supply
 - half wave and full wave rectifiers
 - junction diode characteristics
 - transformer turns ratio and losses
- filter circuits, including:
 - capacitive and inductive filters
 - ripple
- zener diode regulator, including:
 - load and line regulation definitions
 - operating parameters and data sheets
 - zener shunt regulator circuit
- three terminal regulator circuits, including:
 - line and load regulation
 - need for regulation
 - regulated power efficiency
 - remote voltage sensing
 - short circuit protection
 - three terminal regulator characteristics and faults
- electronic testing and measuring devices and techniques, including:
 - test/measuring devices and their application, including:
 - multimeters
 - signal generators and oscilloscopes
 - voltage and digital testers
 - connection of test/measuring devices into a circuit, including:
 - circuit arrangement of test/measuring devices
 - safety procedures
 - taking readings
 - storage, maintenance and care of test/measuring devices
- d.c. power supply testing and fault-finding including:
 - rectifier diode faults
 - zener diode faults
 - three terminal regulator faults
 - capacitor faults
- safe working practices and relevant standards, codes and regulations.

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 workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated 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 other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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