



Australian Government

Assessment Requirements for UEEIC0020 Fault find and repair analogue circuits and components in electronic control systems

Release: 1

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Modification History

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

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 diagnostic methods
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including implementing risk control measures
- applying sustainable energy principles and practices
- completing and reporting faults and repairs
- consulting relevant person/s
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- documenting fault rectification
- finding and repairing faults of analogue circuits
- identifying, rectifying and determining extent of faults and causes
- isolating circuits/machines/plant
- obtaining tools, equipment and testing devices
- rectifying faults in system analogue circuits and components
- testing and measuring live electrical components
- using fault scenarios to test causes of system faults
- verifying the control system operates correctly.

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:

- amplifier fundamentals, including:
 - the purpose and application of amplifiers
 - the basic characteristics of small signal amplifiers
 - the ideal operational amplifier
- basic operational amplifier configurations, including:

- various operational amplifier circuit configurations and where they are used
- measured and calculated values of gain and output voltage for various operational amplifier configurations
- circuit configurations, including:
 - inverting
 - non-inverting
 - voltage follower
 - summing
 - comparators
 - Schmitt trigger
 - differential configurations
- operational amplifier limitations, including:
 - use of frequency compensation
 - offset null
 - bias compensation
 - slew rate
 - frequency response
 - bandwidth
 - noise figures
- single-stage amplifiers, including:
 - determination of direct current (d.c.) bias conditions for a single-stage amplifier
 - small signal terminal characteristics of single-stage amplifiers
 - effects of coupling and by-pass capacitors in single-stage amplifiers
- amplifier applications, including:
 - operation of multi-stage amplifiers
 - effects of component values and frequency response
 - negative feedback loop in multi-stage amplifiers
 - negative feedback and amplifier parameters
 - effects on the output voltage when amplifiers are subjected to control signal overdrive, bias faults and amplifying device faults
- operational amplifier /diode circuits, including:
 - clippers
 - clamp circuits
 - precision rectifiers
- oscillators, including:
 - oscillator circuits using operational amplifiers
 - sine wave
 - square wave
 - triangular wave
 - sawtooth

- operational amplifier /resistance/capacitance (RC) circuits, including:
 - integrator
 - differentiator
 - function generators
- filters, including:
 - active filter circuits
 - first and second order
 - low, high and band pass circuits
- timers, including operation of typical timer integrated circuits
- power amplifiers including:
 - power output integrated circuits
 - power amplifiers using operational amplifiers
 - power supplies
- multi-stage circuits, including:
 - circuits using several different operational amplifier configurations
 - fault-finding procedures
- analogue circuit faults
- analogue circuits and components in electronic control systems
- diagnostic methods
- relevant job safety assessments or risk mitigation processes, including risk control measures
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- sustainable energy principles and practices
- system testing and verification techniques.

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.

Links

Companion Volume implementation guides are found in VETNet - -

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