



Australian Government

MEM30025 Analyse a simple electrical system circuit

Release: 1

MEM30025 Analyse a simple electrical system circuit

Modification History

Release 1. Supersedes and is equivalent to MEM30025A Analyse a simple electrical system circuit.

Application

This unit of competency defines the skills and knowledge required to analyse a simple circuit by identifying the function and operation of the circuit and circuit components contained within approved manufactured products. It covers analysis of simple existing circuits against specifications only and does not extend to determining modifications to circuits.

This unit does not cover the skills involved in direct measuring of values requiring connection or disconnection of circuits and components covered by licensing requirements. Where such values are required, they are to be obtained through the assistance of appropriately licensed personnel or through undertaking the specified training for the appropriate licence.

The unit applies to engineering or related activities and is suitable for people giving technical support in manufacturing or engineering operations and those pursuing technical qualifications and careers at paraprofessional or technician level. All work is carried out under supervision.

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

Pre-requisite Unit

MEM12024 Perform computations

MEM13015 Work safely and effectively in manufacturing and engineering

MEM16006 Organise and communicate information

Competency Field

Engineering technician

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Establish function and purpose of selected circuit	1.1. Follow standard operating procedures (SOPs) and comply with work health and safety (WHS) requirements at all times 1.2. Obtain and interpret all relevant drawings, specifications, manuals

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	and documentation 1.3. Observe circuit and component installation where required to establish function and purpose 1.4. Consult with appropriate personnel to establish job requirements
2. Extract a simple circuit diagram from existing drawings and documentation	2.1. Identify appropriate components and assemblies 2.2. Identify components and/or materials from supplier/manufacturer catalogues 2.3. Obtain a simple circuit diagram 2.4. Use drawing conventions and symbols in the diagram
3. Analyse the circuit for electrical characteristics	3.1. Compare functions of the circuit and components against design characteristics and operational specifications

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Components and assemblies include one or more of the following resistors or capacitors:	• resistors: • fixed (composition and wire wound) • variable (rheostats, potentiometers and trimmers) • non-linear (thermistors) • capacitors: • fixed (ceramic, plastic or electrolytic) • variable • magnetic • transformers (air-forced (AF), radio frequency (RF) and
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	power) • chokes • relays • contactors • rectifiers • smoothing filters • voltage regulators • feedback.
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Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM30025A Analyse a simple electrical system circuit.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM30025 Analyse a simple electrical system circuit

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Performance Evidence

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

- analysing the functions and components of a simple electrical system circuit on at least two occasions
- establishing the function and purpose of selected circuit
- obtaining a simple circuit diagram from existing drawings and documentation
- analysing the circuit for electrical characteristics on at least two occasions.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures
- hazard and control measures associated with analysing the function of a simple electrical system circuit
- dangers and safety precautions
- the function of resistors
- the function of capacitors
- basic electrical physics
- electrical protection methods
- alternating current (AC) circuit
- power supplies:
 - transformers
 - rectifiers
 - smoothing filters
 - voltage regulators and feedback
 - function and operation of a simple low voltage direct current (DC) power supply
 - function and operation of the transformer in a simple low voltage DC power supply, including the significance of the turns ratio

- function in a simple low voltage DC power supply of rectifiers including the significance of the diode characteristics, for both half and full wave types
- operation of smoothing filters in a simple low voltage DC power supply
- operation of simple zener diode type voltage regulators in a simple low voltage DC power supply.
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Assessment Conditions

- Assessors must:
 - have vocational competency in analysing simple electrical system circuits at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the Standards for Registered Training Organisations 2015 or its replacement and comply with the National Vocational Education and Training Regulator Act 2011, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible, assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated
- environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- 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.
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