



Australian Government

Department of Education, Employment and Workplace Relations

MEM30025A Analyse a simple electrical system circuit

Release: 1

MEM30025A Analyse a simple electrical system circuit

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers analysing a simple circuit by identifying the function and operation of the circuit and circuit components contained within approved manufactured products.
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Application of the Unit

Application of the unit	<p>This unit applies to all manufacturing environments. It covers analysis of existing circuits against specifications only and does not extend to determining modifications to circuits.</p> <p>This unit does not cover the skills involved in direct measuring of values requiring connecting or disconnecting 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.</p> <p>Work is conducted in accordance with regulatory and legislative requirements in each State and Territory</p> <p>Work is carried out under supervision.</p> <p>Band: 0</p> <p>Unit Weight: 0</p>
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Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites

Prerequisite units		
Path 1	MEM12024A	Perform computations

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Establish function and purpose of selected circuit	1.1. All relevant drawings, specifications, manuals and documentation are obtained and interpreted in accordance with workplace procedures. 1.2. Circuit and component installation is observed where required to establish function and purpose. 1.3. Safety procedures to be followed are determined in conjunction with supervisors and in accordance with legislative and regulatory requirements. 1.4. Appropriate personnel are consulted with to establish job requirements.
2. Extract a circuit diagram from existing drawings and documentation	2.1. Appropriate components and assemblies are identified. 2.2. Where required, components and/or materials are identified from supplier/manufacturer catalogues. 2.3. Circuit diagram is extracted. 2.4. Drawing conventions and symbols are used in the diagram in accordance with codes and workplace procedures.
3. Analyse the circuit for electrical characteristics	3.1. Functions of the circuit and components are compared against design characteristics and operational specifications.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE
This section describes the skills and knowledge required for this unit.
Required skills
Look for evidence that confirms skills in: <ul style="list-style-type: none"> • calculating • reading and interpreting specifications and drawings • drawing to scale • analysing • planning and sequencing operations • checking and clarifying task-related information • checking for conformance to specifications

REQUIRED SKILLS AND KNOWLEDGE**Required knowledge**

Look for evidence that confirms 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:
 - electrical hazards
 - earthing and insulation
- The function of the following components:
- resistors:
 - fixed (composition and wire wound)
 - variable (rheostats, potentiometers and trimmers)
 - non-linear (thermistors)
- capacitors:
 - fixed (ceramic, plastic and electrolytic)
 - variable
 - magnetic
 - transformers (AF, RF and power)
 - chokes
 - relays
 - contactors
 - rectifiers
 - smoothing filters
 - voltage regulators and feedback
- basic physics:
 - conductors
 - insulators
 - semiconductors
 - current flow
 - voltage
 - resistance
 - colour code
 - power rating
 - Ohm's Law
 - electrical units
 - power in electrical circuits
- protection methods:

REQUIRED SKILLS AND KNOWLEDGE

- fuses
- circuit breaking
- safety interlocks
- earthing - personnel safety
- a.c. circuits:
 - series and parallel a.c. circuits
 - power in a.c. circuits
- power supplies:
 - transformers
 - rectifiers
 - smoothing filters
 - voltage regulators and feedback
 - function and operation of a simple low voltage d.c. power supply
 - function and operation of the transformer in a simple low voltage d.c. power supply, including the significance of the turns ratio
 - function in a simple low voltage d.c. 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 d.c. power supply
 - operation of simple zener diode type voltage regulators in a simple low voltage d.c. power supply
 - feedback

Evidence Guide

EVIDENCE GUIDE	
<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to analyse the functions and components of a simple electrical system circuit. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p>
<p>Context of and specific resources for assessment</p>	<p>This unit may be assessed on the job, off the job or a combination of both. Where assessment occurs off the job, i.e. the candidate is not in productive work, an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with analysing a simple electrical system circuit or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.</p>

EVIDENCE GUIDE

Guidance information for assessment	
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Range Statement**RANGE STATEMENT**

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Components and assemblies

Can include:

- resistors - fixed (composition and wire wound), variable (rheostats, potentiometers and trimmers), non-linear (thermistors)
- capacitors - fixed (ceramic, plastic and electrolytic), variable, magnetic, transformers (AF, RF and power), chokes, relays, contactors, rectifiers, smoothing filters, voltage regulators and feedback

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	

Competency field

Competency field	Engineering technician
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