



Australian Government

MEM18103 Fault-find, test and rectify electrical circuits and equipment

Release: 3

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Modification History

Release 3. Prerequisite units updated

Release 2. Minor adjustments to reflect ERAC requirements for electrician licensing and revision of Essential Performance Capabilities

Release 1. New unit

Application

This unit of competency has been developed for Engineering Tradesperson – industrial electrician apprenticeship training and the recognition of trade-level skills in finding and rectifying faults in electrical circuits and equipment.

It covers safe fault finding testing and procedures in a range of electrical circuits and equipment as well as the rectification of those faults in accordance with the relevant standards.

This unit covers the skills and knowledge required to meet the Electrical Regulatory Authorities Council (ERAC).

Essential Performance Capability (EPC) classified as ‘critical’:

- EPC 54 – Demonstrate the knowledge and skills for diagnosing and rectifying faults in electrical apparatus and associated circuits.

Some jurisdictions require the holder of this unit to be licensed or certified and users should check with the relevant authorities.

Band: A

Unit Weight: 4

Pre-requisite Unit

MEM10016	Terminate and test electrical wiring and accessories
MEM10018	Select cable types and sizes to suit loads and electrical installation environment
MEM10019	Select circuit protection devices by type and rating, fit to switchboards and install earthing
MEM12023	Perform engineering measurements
MEM18001	Use hand tools

MEM18100	Fault-find, test and rectify AC machines and circuits
MEM18102	Fault-find, test and rectify single and three-phase transformers
MEM18104	Dismantle, replace and assemble electrical components and equipment

Competency Field

Maintenance and diagnostics

Elements and Performance Criteria

Elements describe the essential outcomes.

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

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| 1. Determine job requirements | 1.1 Follow standard operating procedures (SOPs) |
| | 1.2 Comply with work health and safety (WHS) requirements at all times, including appropriate risk control measures |
| | 1.3 Use appropriate personal protective equipment (PPE) in accordance with SOPs |
| | 1.4 Research the nature of the fault through checking of documentation and/or consultation with appropriate person/s |
| 2. Prepare to fault find and rectify electrical circuits and equipment | 2.1 Obtain all necessary tools, equipment and testing instruments needed to conduct fault diagnosis and repair of electrical circuits and equipment |
| | 2.2 Isolate and tag circuits and equipment in accordance with procedures |
| 3. Fault find and rectify electrical circuits and equipment | 3.1 Apply diagnostic techniques to locate faults in electrical circuits and equipment, including the use of specialised test equipment |
| | 3.2 Dismantle equipment, where necessary, and repair/replace faulty items and reassemble using appropriate tools and equipment in accordance with |

Elements describe the essential outcomes.

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

manufacturer specifications and regulatory requirements

3.3 Test repaired electrical circuits and equipment to ensure functionality and compliance

3.4 Document reasons and all necessary repairs in accordance with SOPs

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

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.

Circuits include two (2) or more of the following:

- power distribution
- lighting control
- distributed control system (DCS) instrument loop control
- motor control
- package unit control

Single circuit may be controlled by one or more devices and the output may control one or more devices

Complex circuit is defined as interdependent circuits and applies to interconnected electrical circuits where electrical equipment and/or components are connected electrically, that is there are multiple electrical power supplies or sources, voltages or circuits which are found in the control or switching of the circuit

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.

Equipment includes three (3) or more of the following single and three-phase appliances:	• single-phase appliances – hand held power tools, fridges, microwaves, TV's, lighting, motors, air conditioning units, air compressors, portable pumps, pedestal drills, lathes, bench grinders, motors, fans and fan motors • three phase appliances – variable speed drives (VSDs), fan and pump motors, welding machines, freezer units, heaters, general commercial kitchen equipment, generators, air conditioning units, air compressors and air blowers
Diagnostic techniques include:	• testing for voltage, current, frequency, polarity, phase, circuit continuity, insulation resistance and earth continuity
Test equipment includes one (1) or more of the following:	• continuity testers • ammeters • voltmeters • multimeters • tong testers • wattmeters • cathode ray oscilloscopes (CROs)
Regulatory requirements include:	• AS/NZS 3000:2007 Electrical installations (known as the Australian/New Zealand Wiring Rules)
Safe working practices include:	• demonstration of safe working practices and installation in accordance with industry established safe and sound practices

Unit Mapping Information

Release 2. Equivalent. Minor adjustments to reflect ERAC requirements for electrician licensing and revision of Essential Performance Capabilities.

Links

Companion Volume implementation guides are found in VETNet -

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