



Australian Government

MEM18102 Fault-find, test and rectify single and three-phase transformers

Release: 3

MEM18102 Fault-find, test and rectify single and three-phase transformers

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 fault finding and rectifying single and three-phase transformers.

It includes the operating principles of transformers, their construction and open circuit and full load characteristics; types of transformers used in transmission and distribution systems, appliances and welding machines; hazards associated with step and touch voltages, induced voltages and stored energy particularly with high voltages; earthing requirements to limit the rise of touch voltage; safe working procedures for connecting and testing and fault finding transformers.

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

Essential Performance Capabilities (EPCs):

- EPC 18 – Describe the basic construction, principles of operation, and typical applications of the main types of transformers.

And

Essential Performance Capabilities (EPCs) classified as ‘critical’:

- EPC 19 – List the key safety issues of various types of transformers, including AS/NZS 3000 requirements.
- EPC 48 – Demonstrate knowledge and understanding of the significant dangers of High Voltage equipment and distribution systems.

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
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.

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
2. Prepare to fault find single and three-phase transformers and associated circuits	2.1	Obtain all necessary tools, equipment and testing instruments needed to conduct fault diagnosis of single and three-phase transformers and circuits
	2.2	Isolate and tag circuits and equipment in accordance with procedures

Elements describe the essential outcomes.

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

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| 3. Fault find single and three-phase transformers and associated circuits | 3.1 Apply diagnostic techniques to fault find single and three-phase transformers and associated circuits using appropriate test equipment |
| | 3.2 Remove/repair/replace faulty components/circuits in accordance with manufacturer specifications and regulatory requirements |
| | 3.3 Test single and three-phase transformers associated circuits to ensure functionality in accordance with specifications |
| | 3.4 Carry out routine maintenance on transformers, including oil testing, silica gel change and bushing repairs, where applicable |
| | 3.5 Document 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.

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- Transformers include two (2) or more of the following:**
- instrument
 - current
 - voltage
 - oil filled transformers
 - high voltage (HV) power transformers
 - low voltage (LV) power transformers
 - neutral
 - distribution:
 - step up
 - step down
- 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>