Australian Government

MEM10021 Inspect, test and verify electrical installations

Release: 3

MEM10021 Inspect, test and verify electrical installations

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 inspecting, testing and verifying electrical installations in accordance with the AS/NZS 3000:2007, Electrical Installations (known as the Australian/New Zealand Wiring Rules) and regulatory requirements.

It covers all aspects inspection and testing, including visual, application of mandatory testing, interpreting test results and recording reporting requirements.

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

Essential Performance Capabilities (EPCs) classified as 'critical':

- EPC 26 – Demonstrate the appropriate methods for the installation, modification and testing of electrical installations and equipment for construction and demolition sites, complying with AS/NZS 3012 and applicable workplace safety legislation. Need for calibration of instruments.
- EPC 30 – Demonstrate to AS/NZS 3000 and AS 3017 standards the electrical checks and tests required to ensure electrical installations are safe, reporting of test results typically required to satisfy regulatory requirements.

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

MEM10020	Install low voltage cabling and fit-off accessories, appliances and equipment
MEM10022	Commission and decommission high and low voltage equipment or installations
MEM10023	Design and connect control switching of circuits for building services and industrial equipment
MEM10024	Install and troubleshoot luminaires and ancillary equipment
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
MEM18103	Fault-find, test and rectify electrical circuits and equipment
MEM18104	Dismantle, replace and assemble electrical components and equipment

Competency Field

Installation and commissioning

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 Identify job requirements from specifications, drawings, job sheets or work instructions

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.	
2. Prepare to inspect, test and verify electrical installations	2.1	Review all relevant documentation pertaining to the electrical installation in preparedness for testing and verification
	2.2	Consult with relevant personnel in readiness for inspection, verification and testing of the electrical installation
	2.3	Obtain all necessary tools, equipment and testing instruments needed to verify compliance ensuring all instruments are calibrated
3. Inspect, test and verify electrical installations	3.1	Isolate and tag circuits and equipment in accordance with procedures, where required
	3.2	Carry out a visual inspection of the electrical installation in accordance with the Testing and Verification – Visual Inspection Check List described in the Australian/New Zealand Wiring Rules
	3.3	Conduct all mandatory tests to verify that the earthing conductor resistance, insulation resistance, all polarities and circuit connections meet the requirements in accordance with the Australian/New Zealand the Wiring Rules
	3.4	Conduct optional testing to verify that the fault-loop impedance and the operation of residual current devices meet the requirements in accordance with the Australian/New Zealand the Wiring Rules
4. Report inspection and test results	4.1	Identify and report all defects and make recommendations for rectification in accordance with SOPs
	4.2	Complete all mandatory documentation in accordance with regulatory and local supply authority requirements

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.

Electrical installations include:

- at least one (1) general electrical installation comprising a main switchboard, supplying more than one circuit each for lighting, socket outlets and fixed appliances
- at least one (1) industrial electrical installation comprising a distribution board separate from the main switchboard and at least one (1) circuit supplying a three-phase load and safety system in one of the following industrial environments:
  - factory
  - building
  - off shore platform
  - mine site processing
  - oil and gas installation
  - processing plant
  - workshop
  - underground installation
- three-phase loads include at least one (1) or more of the following:
  - motors – for pumps, conveyors, mills, agitators, crushers and screening plants
  - heaters
  - compressor packages
  - heating, ventilation and air conditioning (HVAC) units
  - facility accommodation units, sea container workshops and storage units, and laboratories
  - workshop equipment, including lathes, milling machines and welders
  - underground dewatering systems and ‘gate end’ boxes for drilling equipment

Regulatory requirements

- AS/NZS 3000:2007 Electrical Installations (known as the

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.

include:	Australian/New Zealand Wiring Rules) • AS/NZS 3017:2007 Electrical installations – Verification guidelines. • AS/NZS 3018:2001 Electrical Installations – Domestic installations • AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment • AS/NZS 3012:2010 Electrical installations – Construction and demolition sites
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