



Australian Government

Assessment Requirements for 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

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting circuits, drawings and specifications relevant to the work to be undertaken
- determining the electrical and non-electrical isolation requirements to prevent the creation of hazards linked from the loss of machine/system/process control according to established procedures
- using lock out tag procedures with appropriate tags/signs
- proving electrical isolation and following established safety rules prior to working on electrical equipment or wiring
- ensuring all electrical equipment and tools are tested and tagged and up to date
- applying methodical diagnostic techniques and using safe working practices to fault find electrical circuits and equipment
- using test equipment, including the use of multimeters, cathode ray oscilloscopes (CROs), signal/function generators and power supplies in diagnosing faults in electrical circuits and equipment
- taking measurements and compare the results to the calculated value
- dismantling, repairing and replacing faulty components and equipment using appropriate hand and power tools and engineering techniques
- carrying out electrical tests for continuity and insulation resistance tests on single and three-phase appliances and equipment
- repairing faulty electrical installation circuits, components and wiring to comply with relevant standards
- retesting according to regulatory and legislative requirements
- documenting all reasons and remedial action taken in accordance with SOPs.

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 and use of personal protective equipment (PPE)
- fault finding techniques, including:
 - visual inspection
 - signal injection and measurement
 - half split rule and component isolation
 - interpreting wiring and equipment circuits, drawings and specifications
- test equipment for diagnosing faults including multimeters, ammeters, voltmeters, continuity testers, wattmeters and tong testers
- specialised alternating current (AC) test equipment, including:
 - CRO and its operating features, interpreting a CRO screen, dual trace CROs and its advantage over a single trace CRO and CRO applications
 - signal, function generators and power supplies and their operating features and applications when fault finding AC circuits
- diagnostic techniques, including testing for voltage, current, frequency, polarity, phase, circuit continuity, insulation resistance and earth continuity
- wiring faults, including short circuit, open-circuit, high resistance, breakdown in insulation resistance, residual current device (RCD) tripping, transposition of conductors, earthing, loose connections and corrosion
- power distribution, lighting control, signal and data, motor control and package unit control circuits
- lighting faults, including switching, lamp holders, ballast, starter, capacitor, igniter, transformer, loose connections, poor contact, corrosion and lighting management systems
- equipment faults in the following single-phase appliances:
 - hand held power tools, fridges, microwaves, hot water systems, TV's, motors, air conditioning units, air compressors, portable pumps, pedestal drills, lathes, bench grinders, motors, fans and fan motors
- equipment faults in the following three-phase appliances:
 - variable speed drives (VSDs), fan and pump motors, freezer units, welding machines, heaters, general commercial kitchen equipment, generators, air conditioning units, air compressors and air blowers
- mechanical faults in motors, including bearings, fans, bent shaft, locked rotor, blocked air vents, centrifugal switches, slipping belts and environmental factors.

Assessment Conditions

- Assessors must:
 - have vocational competency in fault finding, testing and rectifying electrical circuits and equipment 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* and comply with the *National Vocational Education and Training Regulator Act 2011* or equivalent legislation covering VET regulation in a non-referring State 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. This must 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.

Links

Companion Volume implementation guides are found in VETNet -

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