



Australian Government

**Assessment Requirements for MEM10019
Select circuit protection devices by type and
rating, fit to switchboards and install
earthing**

Release: 3

Assessment Requirements for MEM10019 Select circuit protection devices by type and rating, fit to switchboards and install earthing

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, plans and specifications relevant to the work to be undertaken
- determining the individual load requirements of the installation
- selecting the appropriate switchboard and layout arrangements
- complying with Australian/New Zealand Wiring Rules, other Australian Standards, e.g. AS/NZS 3008.1.1:2009 Electrical Installations – Selection of cables – Cables for alternating voltages up to and including 0.6/1 kV – typical Australian installation conditions, Service Rules and other relevant standards when selecting circuit protection controls and devices in regard to the following aspects:
 - protection against indirect contact, overcurrent or excess earth leakage current conditions and over and under voltage by selecting and installing using safe working practices:
 - a fuse/s for fault current limiting protection
 - an appropriate circuit breaker/s with a current rating not less than the maximum demand of the portion of the electrical installation they control
 - a residual current device (RCD) with a maximum rated residual current of 30 mA
 - control of the electrical installation (or parts thereof) by suitable switching arrangements by selecting and installing using safe working practices:
 - a main switch/es to control the whole of the electrical installation
 - switches for isolation, emergency, mechanical maintenance and functional (control) with appropriate Ingress Protection (IP) rating
 - installing and terminating the compliant earthing system components for the multiple earthed neutral (MEN) system and other earthing arrangements
 - terminating all circuit protection controls and devices

- inspect visually all components and earthing system to ensure compliance
- test earthing system for continuity and insulation resistance
- identify with marking all switches, circuit breakers and RCDs and other electrical equipment on or adjacent to the switchboard
- using test equipment to locate faults, completing remedial action and retesting to ensure compliance
- documenting reasons for selection and installation arrangement requirements 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)
- Australian/New Zealand Wiring Rules and other related standards in regards to the following:
 - requirements for the selection and installation of switchgear and controlgear, including:
 - protection against indirect contact
 - protection against over current or excess earth leakage current conditions
 - protection against over voltage and under voltage
 - control of the electrical installation (or parts thereof) by suitable switching arrangements
 - design, selection (including form type) and installation of switchboards
 - design of an electrical installation
 - design, selection (including form type) and installation of switchboards
 - application and segregation requirements of separated extra-low voltage (SELV) and protected extra-low voltage (PELV) circuits, including earthing requirements and testing
 - application and arrangement of an isolated supply
 - hazards and risks in an electrical installation
 - protection against indirect contact, including:
 - methods of protection
 - protection by automatic disconnection of supply
 - touch-voltage limits
 - earthing system impedance
 - disconnection times
 - supplementary equipotential bonding
 - protection by the use of Class II equipment or by equivalent insulation
 - protection by electrical separation
 - protection by the use of RCDs
 - protection against thermal effects in normal service

- protection against unwanted voltages
- protection against over current and fault currents
- protection against over voltage
- protection against injury from mechanical movement
- devices for isolation
- fire integrity
- protection from damp situations
- earthing system terms, parts and arrangement
- devices and operating principles for automatic disconnection of supply, including circuit breakers, fuse and RCDs
- devices for isolation and switching, including for the following functions:
 - isolation
 - emergency
 - mechanical maintenance
 - functional (control)
- switchboards and distribution boards purpose, types, application, layout and compliance requirements
- bonding of metallic meter enclosures
- minimum fault levels specified by electricity network operator
- methods for determining prospective fault current
- MEN arrangement, resultant fault current path and magnitude, operation of protective devices and implication of MEN link absence during fault conditions
- knowledge of alternate earthing systems when required by local Regulatory Authorities, e.g. TT low voltage supply earthing system in dairy sheds in New Zealand
- construction and demolition requirements as per AS/NZS 3012:2010 Electrical Installations – Construction and demolition sites.

Assessment Conditions

- Assessors must:
 - have vocational competency in selecting circuit protection devices by type and rating, fitting to switchboards and installing earthing 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 condition. 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>