



Australian Government

Assessment Requirements for MEM10018 Select cable types and sizes to suit loads and electrical installation environment

Release: 2

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Modification History

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 cable routes, length and conditions in which the wiring system is to operate
- complying with relevant Australian/New Zealand Wiring Rules, Cable Selection and Service Rules when selecting cables ensuring coordination between protective devices and conductors in regard to the following aspects:
 - design of the circuit taking into account the safety considerations
 - determining the final subcircuit arrangements
 - determining the factors affecting suitability of wiring systems
 - calculating the maximum demand on consumer mains/submains
 - calculating the current-carrying capacity requirements
 - calculating the voltage drop requirements
 - calculating the expected fault loop impedance
 - selecting cables to satisfy voltage drop, current-carrying capacity and fault loop impedance requirements
 - selecting the appropriate protection devices
 - selecting the appropriate isolation devices and switching arrangements
- selecting earthing system parts to meet the multiple earthed neutral (MEN) system
- documenting reasons for selection and installation 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)
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- Australian/New Zealand Wiring Rules, 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 and other related standards in regards to the following:
 - design and safety performance requirements, including:
 - protection of persons, livestock and property from harmful effects
 - correct functioning of the electrical installation for intended use
 - compatibility with the electricity distribution system, or other source of supply, to which the electrical installation is to be connected
 - type of insulation required:
 - thermoplastic
 - elastomer
 - cross-linked polyethylene (XLPE)
 - mineral-insulated metal sheath (MIMS)
 - high temperature
 - supply characteristics
 - reasons for dividing installations into circuits and factors that determine their number and type
 - external influences that may damage installation and be considered in the design, including applying derating factors caused by the effect of:
 - grouping of cables
 - ambient temperature
 - depth of laying
 - thermal resistivity of soil
 - varying of loads
 - thermal insulation
 - direct sunlight
 - acceptable methods of protection against risks of ignition of flammable materials
 - likely sources of unwanted voltages and methods of dealing with this potential hazard
 - requirements for protection against fault current
 - protection against harmful effects of faults between live parts of circuits supplied at different voltages
 - mechanical movement protection
 - fire rated construction and how integrity of fire rating can be maintained
- final subcircuit arrangements, including:
 - factors to consider when determining the number and type of circuits required
 - daily and seasonal demand for lighting, power, heating and other loads in a given installation
 - factors affecting current-carrying capacity of cables
 - layout/schedule of circuits
- factors affecting suitability of wiring systems

- acceptable methods of determining maximum demand on an installation's consumer's mains and submains up to 400 A per phase
- external factors that require the use of a derating factor when determining current-carrying capacity
- requirements for maximum voltage drop in an installation and relevant tables for unit values of voltage drop
- requirements for maximum fault loop impedance in an installation and the relevant tables to determine cable impedances
- accepted methods used against indirect contact when selecting protection devices to protect against overload and short circuit current situations
- provision of isolation of every circuit for a range of installations and conditions
- earthing system parts including the selection of earth electrode, main earthing conductor, main earthing terminal/connection or bar, MEN link, protective earthing conductors and equipotential bonding
- effects of harmonic current on current-carrying capacity
- conditions where short circuit performance may need to be considered.

Assessment Conditions

- Assessors must:
 - have vocational competency in selecting cable types and sizes to suit loads and electrical installation environment 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>
