



Australian Government

MEM10020 Install low voltage cabling and fit-off accessories, appliances and equipment

Release: 3

MEM10020 Install low voltage cabling and fit-off accessories, appliances and equipment

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 installing low voltage cabling/wiring; fitting off accessories, appliances and equipment to an electrical switchboard in a variety of situations; and connecting consumer mains to an installation.

It covers a comprehensive understanding of AS/NZS 3000:2007 Electrical Installations (known as the Australian/New Zealand Wiring Rules) and regulatory requirements and knowledge of other standards that apply to particular situations and installations for selecting and fixing of accessories; the location of switchboards; arrangement and identification of switchboard equipment; and access requirements, including the separation and minimising the spread of fire.

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

Essential Performance Capabilities (EPCs):

- EPC 29 – Knowledge of the AS/NZS 3000 requirements for safety services and issues relevant to HV installations. Standards referenced for electrical installations related to transportable structures and vehicles, shows and carnivals, patient areas, marinas and boats, and construction/demolition sites.
- EPC 36 – Demonstrate the knowledge and skills for the installation of wiring support systems.
- EPC 39 – Determine and apply AS/NZS 3000 requirements for the installing, terminating and testing of catenary supported cables, pendant-type socket outlets and trailing cables.

And

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

- EPC 24 – Demonstrate an understanding of the AS/NZS 3000 and regulatory requirements for the location of switchboards and the arrangement of switchboard equipment in installations. Methods for determining prospective fault current. Switchboard form types.
- EPC 25 – Demonstrate an understanding of the AS/NZS 3000 and regulatory requirements for the installation of electrical equipment in given damp situations and wet areas. IP rating of electrical equipment.

- 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 27 – Demonstrate knowledge of AS/NZS 3000 and local regulatory requirements for the installation of aerial conductors and underground wiring. Including specialist cables.
- EPC 28 – Demonstrate knowledge of AS/NZS 3000 requirements for electrical installations in hazardous areas and an awareness of the standards to which it refers.
- EPC 35 – Demonstrate the knowledge and skill to install and terminate a variety of electrical cables in a wide range of applications (including final subcircuits) to AS/NZS 3000.
- EPC 37 – Demonstrate knowledge and skills to install final subcircuit wiring into switchboards and connect to switchboard equipment in accordance with AS/NZS 3000 and local supply authority requirements.
- EPC 38 – Connect consumer mains to an installation, in accordance with AS/NZS 3000 and local supply authority 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 controls devices by type and rating, fit to switchboards and install earthing
MEM10023	Design and connect control switching of circuits for building services and industrial equipment
MEM10024	Install and troubleshoot luminaires and ancillary equipment
MEM18001	Use hand tools

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.

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|---|---|
| 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 |
| 2. Plan installation of electrical wiring, accessories and appliances | 2.1 Plan cable routes in accordance with requirements contained in the job instructions/specifications |
| | 2.2 Obtain necessary cables, appropriate cable support systems and enclosures, accessories and appliances needed for the installation work in accordance with established procedures and check against job requirements |
| | 2.3 Obtain necessary tools, equipment and testing instruments needed for the installation work |
| 3. Install and fit off electrical wiring, accessories and appliances | 3.1 Isolate and tag circuits and equipment in accordance with procedures, where required |
| | 3.2 Install and fix cable support system in position ensuring components are square and plumb, securely attached using fastenings appropriate to the weight of the components and the material of the mounting |
| | 3.3 Install electrical cables and wiring, accessories and appliances in compliance with specifications and regulatory requirements |
| | 3.4 Maintain fire integrity when installing electrical cables and wiring |
| | 3.5 Check installed accessories and appliances are straight and square in the required locations |
| | 3.6 Terminate cables and conductors at switchboards, |

Elements describe the essential outcomes.

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

accessories and appliances in accordance with manufacturer specifications and regulatory requirements

3.7 Test and inspect installed circuits to ensure compliance in accordance with legislative and regulatory requirements

3.8 Rectify any defects and re-test to ensure compliance

3.9 Document installation of wiring, accessories and appliances in accordance with SOPs

4. Connect consumers mains to an installation

4.1 Install underground and overhead consumers mains

4.2 Install unprotected consumers mains to reduce the risk of short circuit to a minimum

4.3 Terminate consumers mains at pillars, pits, mains connection boxes and consumers switchboard

4.4 Install bonding conductors, where required

4.5 Ensure correct polarity

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 circuit supplying a three-phase load and safety

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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

Cable routes include one (1) or more of the following:

- internal to buildings
- underground
- aerial

Electrical cable and wiring types include five (5) or more of the following:

- thermoplastic insulated cable (TPI)
- flat thermoplastic sheathed (TPS)
- circular thermoplastic sheathed (TPS)
- steel wired armoured (SWA)
- fire rated cable (HT or HF or MIMS)
- cross-linked polyethylene (XLPE) cables
- neutral screened cables
- flexible cables
- aluminium conductor/cable
- underground cables

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- aerial conductors

Termination of cables and cords include two (2) or more of the following connectors and lugs:

- connectors:
 - screw
 - stud
 - tunnel
- lugs:
 - crimp and compression
 - soldering
 - solderless

Cable support systems include four (4) or more of the following:

- metallic conduit
- non-metallic conduit
- trunking
- duct
- cable tray/ladder
- catenary
- posts/poles/struts

Regulatory requirements include:

- AS/NZS 3000:2007 Electrical installations (known as the Australian/New Zealand Wiring Rules)
- AS/NZS 3018.1 Electrical installations – Domestic installations (or its equivalent updated version)
- local supply authority requirements

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>