

Title	Demonstrate electrical knowledge for Electronic Security Installers		
Level	3	Credits	4

Purpose	<p>This unit standard covers the knowledge of electrical theory, legislation, and standards required for registration as <i>Electrician limited to Electronic Security Installer</i>.</p> <p>People credited with this unit standard are able to demonstrate knowledge of:</p> <ul style="list-style-type: none"> – the New Zealand Multiple Earthed Neutral (MEN) system and earthing; – circuit protection and protection devices; – electrical safe working practices and testing; – electrical cables and circuits relevant for Electronic Security Installers; and – electrical legislation, codes of practice, and standards relevant for Electronic Security Installers.
----------------	--

Classification	Electronic Engineering > Electronic Security
-----------------------	--

Available grade	Achieved
------------------------	----------

Guidance Information

- 1 This unit standard was developed as a component of the National Certificate in Electronic Security (Level 3) [Ref: 0414], which includes training and assessments relating to the cabling and connection of security control panels to existing 230 volt subcircuits. Candidates who have obtained the National Certificate may apply to the Electrical Workers Registration Board (EWRB) for registration and licensing as *Electrician limited to Electronic Security Installer*. This registration is a limited electrical registration, which covers the safe connection of cabling and security control panels to existing 230 volt subcircuits in domestic installations. It does not cover work at switchboards other than circuit isolation or fuse replacement.
- 2 In order to satisfy the requirements of the EWRB for registration as *Electrician limited to Electronic Security Installer*, candidates must pass the EWRB’s *Limited Electrician Examination for Electronic Security Installers*, which is the only valid assessment tool for this unit standard. Credit for this unit standard can only be granted on evidence of a pass in this examination or by RPL to candidates who are Registered Electricians, Registered Electrical Engineers, holding an EWRB Qualified Electrical Engineer Identification Card. Existing credit for units 1702 and 21766 provides exemption from the requirements of 20592.

- 3 Competency in this unit standard should be assessed only after competency in the following unit standards has been achieved, or equivalent knowledge and skills demonstrated:
- Unit 1204, *Demonstrate knowledge of earthing;*
 - Unit 1205, *Demonstrate knowledge of electrical switchboards;*
 - Unit 15855, *Demonstrate knowledge of circuit protection;*
 - Unit 15856, *Demonstrate knowledge of the electricity network and the multiple earthed neutral system of supply;*
 - Unit 15859, *Demonstrate knowledge of electrical cables and accessories;*
 - Unit 15861, *Demonstrate knowledge of direct current (d.c.) power supplies;*
 - Unit 15864, *Demonstrate knowledge of semiconductor power devices;*
 - Unit 15871, *Demonstrate knowledge of electrical installation in damp situations.*
- 4 Competency under this unit standard does not entitle the candidate to legally connect security control panels to subcircuits without appropriate supervision, until he/she has been registered and licensed.
- 5 References
- AS/NZS 3000:2007, Electrical installations (known as the Australian/New Zealand Wiring Rules);
 - AS/NZS 3008.1.2:1998, Electrical Installations – Selection of Cables, Cables of alternating voltages up to and including 0.6/1kV, Typical New Zealand installation conditions;
 - AS/NZS 3760:2003, In-service safety inspection and testing of electrical equipment;
 - AS/NZS 3820:1998, – Essential safety requirements for low voltage electrical equipment;
 - Electrical Workers Registration Board, *Manual for Safety Training in the Electrical Industry*, March 2000, Wellington;
 - Electricity Act 1992;
 - Electricity Regulations 1997;
 - AS/NZS 3019 2007, Electrical installations – Periodic verification and all subsequent amendments and replacements.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the New Zealand Multiple Earthed Neutral (MEN) system and earthing.

Performance criteria

- 1.1 Terminology associated with the MEN system is explained.
- | | |
|-------|--|
| Range | terminology includes – phase, neutral, earth, single phase, three phase, conductor, earthed, electrode, electrical supply authority, consumer, extra low voltage, low voltage, medium voltage, high voltage, live or alive, service fuse, service line, earth fault current. |
|-------|--|
- 1.2 The MEN system of supply is explained with reference to a typical distribution system from supply transformer to consumer subcircuit load.

- 1.3 The reasons for earthing the neutral at multiple points are stated.
- Range line voltage is fixed to a known value, operation of protective devices, reduced resistance in fault current path.
- 1.4 The reasons and requirements for earthing of exposed conductive parts of electrical equipment are stated.
- 1.5 A simple earth fault current involving resistive elements only is calculated.
- 1.6 The minimum size of earthing conductor for given subcircuit conditions is determined.

Outcome 2

Demonstrate knowledge of circuit protection and protection devices.

Range protection devices – fuses including rewirable, cartridge, miniature glass, high rupturing capacity (HRC) fuses; miniature circuit breakers (MCB); residual current devices (RCD).

Performance criteria

- 2.1 Electrical faults are identified on given diagrams, and effects explained in terms of danger to people and property.
- Range faults – leakage current, over current, short circuit; effects – electromechanical energy, heat energy, cable damage, equipment damage, electric shock, burns, electric arcing, eye damage, fire.
- 2.2 Protection devices are described with the aid of diagrams and reference to construction, operating principles, and purpose.
- 2.3 Protection devices and rating are identified by sight.
- 2.4 Protection devices are classified according to their ability to provide either coarse or close excess current protection.

Outcome 3

Demonstrate knowledge of electrical safe working practices and testing.

Performance criteria

- 3.1 Safety issues within current legislation and standards are identified and explained.
- Range safety issues include – hazard identification, accidents, protective clothing, ear muffs, goggles, gloves, safety footwear, ladders, safety belts and harnesses, helmets, good house keeping, basic first aid and cardiopulmonary resuscitation.

- 3.2 Isolation procedures are identified and explained.
- Range safety barriers, danger tags, out of service tags, instrument verification tests, prove-test-prove regime.
- 3.3 Subcircuit tests relevant to the work covered by Electronic Security Installer registration are identified and explained.
- Range visual inspection; continuity and resistance of protective earthing conductor, insulation resistance, polarity, correct circuit connections, operation of RCD.
- 3.4 The negative outcomes that could arise through incorrect cable selection and installation are identified and explained.
- Range outcomes – electrocution, electric shock, fire, electrical overload, electrical interference, false alarms.

Outcome 4

Demonstrate knowledge of electrical cables and circuits relevant for Electronic Security Installers.

Performance criteria

- 4.1 Cable characteristics are stated and a typical application given according to industry practice.
- Range flexible cables – circular section PVC, rubber sheathed; fixed wiring cables – tough plastic sheathed (TPS), conduit wire, butyl rubber insulated (BRI) or vulcanised india rubber (VIR), neutral screened cable.
- 4.2 Causes of cable degradation are listed and remedial action recommended.
- Range insulation damage, insulation perished, oxidization of conductors, conductor damage, moisture penetration.
- 4.3 Answers and explanations are presented to questions relating to circuit and wiring diagrams of domestic subcircuits with connections to security control panels.
- 4.4 Cable types and sizes for connection of security control panels to given existing subcircuits are determined.

Outcome 5

Demonstrate knowledge of electrical legislation, codes of practice, and standards relevant for Electronic Security Installers.

Performance criteria

- 5.1 Answers and references to relevant clauses are presented in response to questions regarding any aspects of legislation, codes of practice, and standards within the scope of Electronic Security Installer registration.
- 5.2 The type of work covered by the Electronic Security Installer registration is identified.
- 5.3 The licensing system and its requirements are explained.
- 5.4 Situations requiring the issuing of a Certificate of Compliance are identified.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	23 March 2004	31 December 2008
Review	2	21 November 2008	31 December 2021
Review	3	24 January 2019	31 December 2021

Consent and Moderation Requirements (CMR) reference	0003
--	------

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.