Title	**Demonstrate knowledge of capacitors, inductors, and electronics in the electrical trade**		
Level	**3**	**Credits**	**5**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: – capacitors and inductors; and – electronics in the electrical trade.

Classification	Electrical Engineering > Core Electrical

Available grade	Achieved

Guidance Information

1 Unit standard or equivalent prior knowledge and skills recommended:
Unit 32609, *Demonstrate knowledge of mathematical principles, conductors and insulators*.

2 References
AS/NZS 3000 (version as cited in the Electricity (Safety) Regulations), *Electrical Installations (known as the Australian/New Zealand Wiring Rules)*;
AS/NZS 4836:2011, *Safe working on or near low-voltage electrical installations and equipment;*
Health and Safety at Work Act 2015*;*
or any current subsequent amendments and replacements.

3 Definition
DC – direct current.

4 This unit standard can be used together with other relevant unit standards, additional learning and workplace training to meet the requirements of the Electrical Workers Registration Board (EWRB) core competencies, available at https://www.ewrb.govt.nz.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of capacitors and inductors.

Performance criteria

1.1 Describe the operation of capacitors and inductors.

Range must include but is not limited to – construction, operation, factors affecting the characteristics.

1.2 Define the phase relationships between voltage and current in inductive and capacitive circuits.

1.3 Outline the effects of the phase relationship between voltage and current on power and power factor.

1.4 Describe the safety requirements and handling techniques for capacitors.

Range handling, installing, testing.

1.5 Identify AS/NZS 3000 requirements for capacitors.

Range two requirements.

Outcome 2

Demonstrate knowledge of electronics in the electrical trade.

Performance criteria

2.1 Explain using semiconductor theory, the function, operation and applications of common electronic components.

Range three components;
may include but is not limited to – diodes, SCRs (thyristors), thermistors, transistors, diacs, triacs.

2.2 Explain the operation and function of capacitors used in simple electronic circuits.

Range non-polarised, polarised (electrolytic).

2.3 Describe how to take measurements within simple electronic circuits.

Range measurements from two circuits;
simple circuits may include but are not limited to – half wave rectifier, full wave rectifier, simple DC power supply, simple speed control, simple dimmer circuit.

2.4 Describe general precautions for the safe handling and testing of electronic components and circuitry.

Planned review date	31 December 2026

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 March 2022	N/A

Consent and Moderation Requirements (CMR) reference	0003

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

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@waihanga.nz if you wish to suggest changes to the content of this unit standard.