

## National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing) (Level 4) with strands in Commercial Electrical Appliances, Domestic Electrical Appliances, Electronic Consumer Goods, Office Equipment, and Portable Electrical Appliances and Power Tools

<b>Level</b>	<b>4</b>
<b>Credits</b>	<b>75 – 90 depending on strand</b>

This qualification has been **reviewed**. The last date to meet the requirements is 31 December 2021.

### Transition Arrangements

Version 2 of this qualification was republished in December 2018 to change its last date for assessment from 31 December 2022 to 31 December 2021.

Version 2 of this qualification was republished in December 2017 to extend its last date for entry into programmes from 31 December 2017 to 31 December 2018.

This qualification has been reviewed and replaced by the New Zealand Certificate in Electrical Engineering (Electrical and Electronic Installation and Service) (Level 4) with strands in Domestic Systems and Products, Commercial Equipment, and Consumer Electronics [Ref: 2768].

This qualification contains an expiring and expired unit standards. For the purposes of this qualification, people who have gained credit for the replacement unit standards are exempt from the requirement to gain credit for replacement standards – see below.

<b>Credit for</b>	<b>Exempt from</b>
26725	20721
26726	20724
26727	8191

For detailed information see [Review Summaries](#) on the NZQA website.

People working towards this qualification may complete its requirements or transfer their results to the replacement New Zealand qualification.

The last date for entry into programmes leading to this qualification is 31 December 2018.

The last date for assessments to take place for this qualification is 31 December 2021, when the qualification will be discontinued. From this date, no results can be reported against the qualification.

It is recommended that candidates currently enrolled in programmes leading to this qualification and unable to complete it by 31 December 2021 transfer their existing achievement to the replacement qualification.

This qualification contains standards that replace earlier standards. For the purpose of this qualification people who have gained credit for the expiring standards are exempt from the requirement to gain credit for the replacement standards.

Credit for	Exempt from
2670	20591
2679	20591
18083	22764

It is anticipated that no existing candidates will be disadvantaged by these transition arrangements. However, anyone who feels that they have been disadvantaged may appeal to The Skills Organisation at the address below. Appeals will be considered on a case-by-case basis.

### NZQF National Qualification Registration Information

Process	Version	Date	Last Date for Award
Registration	1	November 2006	December 2019
Review	2	May 2015	December 2021
Republished	2	December 2017	December 2021
Republished	2	December 2018	December 2021

### Standard Setting Body

The Skills Organisation  
 Freepost 5164  
 PO Box 24-469  
 Royal Oak  
 Auckland 1345

Telephone 09 525 2590  
 Fax 09 525 2591  
 Email [reviewcomments@skills.org.nz](mailto:reviewcomments@skills.org.nz)  
 Website <http://www.skills.org.nz/>

## **National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing) (Level 4) with strands in Commercial Electrical Appliances, Domestic Electrical Appliances, Electronic Consumer Goods, Office Equipment, and Portable Electrical Appliances and Power Tools**

**Level** 4

**Credits** 75 – 91 depending on strand

### **Purpose**

This qualification is for people engaged in the servicing of commercial electrical appliances, domestic electrical appliances, electronic consumer goods, office equipment, portable electrical appliances and power tools. It incorporates a variety of skills and knowledge needed to pursue a career as an electrical appliance service technician or an electronics technician, as reflected in the five strands of the qualification:

- Commercial Electrical Appliances – for example industrial refrigeration, industrial grade electrical appliances and equipment.
- Domestic Electrical Appliances (whiteware) – for example domestic stoves, refrigerators.
- Electronic Consumer Goods (brownware) – for example televisions, Digital Versatile Disc players, and sound systems.
- Office Equipment – for example facsimile machines, photocopiers and printers.
- Portable Electrical Appliances and Power Tools – for example cake mixers, electric shavers, hair dryers, electric drills and skill saws.

After qualifying for the national certificate in one strand, technicians may qualify for additional strands by completing only the requirements of that additional strand's unit standards.

This qualification builds on any of the following National Certificates; National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing) (Level 3) [Ref: 1265], the National Certificate in Electrical Engineering (Level 2) [Ref: 0174], or the National Certificate in Electronic Engineering (Level 3) [Ref: 1093] and is typically gained during the third or fourth year of training and work experience.

The compulsory section is designed to ensure that all holders will have knowledge and skills relating to:

- alternating current theory
- direct current power supplies
- first aid and cardio-pulmonary resuscitation
- report writing
- safe electrical work practices
- semiconductor power devices
- three-phase theory.

This qualification may lead to the National Diploma in Engineering (Level 6) with strands in Computer Engineering, Electrical Engineering, Electronics, Industrial Measurement and Control, and Telecommunications [Ref: 0846].

### Replacement Information

This qualification together with the National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing) (Level 3) [Ref: 1265] replaced the National Certificate in Electrical Appliance Servicing [Ref: 0827].

### Special Notes

This qualification was created to rationalise training and assessment of Electrical Appliance Servicing and Electronic Servicing technicians. This qualification incorporates some of the skills required for Electronic Engineering Service technicians that are incorporated in the National Certificate in Electronic Engineering (Level 4) [Ref: 1123].

### Prerequisites

There are three prerequisite options for entry into this qualification. The first option allows entry into any strand, and the second and third options are strand-specific for candidates who do not hold option one:

- 1 The National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing) (Level 3) [Ref: 1265]; or
- 2 For strands in Commercial Electrical Appliance, Domestic Electrical Appliance, and Portable Electrical Appliances and Power Tools, the National Certificate in Electrical Engineering (Level 2) [Ref: 0174] together with passes in the EWRB Limited Service Technician A and B theory examination and practical assessments; or
- 3 For strands in Electronic Consumer Goods, and Office Equipment, the National Certificate in Electronic Engineering (Level 3) [Ref: 1093].

### Credit Range

	Core Compulsory
Level 2 credits	3
Level 3 credits	3
Level 4 credits	12
Minimum total	18

	Commercial Electrical Appliances Strand		
	Compulsory	Elective A	Elective B
Level 3 credits	4	0-9	0-21
Level 4 credits	32	0-23	0-8
Minimum totals	36	15	10
Qualification total with strand	79		

<b>Domestic Electrical Appliances Strand</b>			
	<b>Compulsory</b>	<b>Elective A</b>	<b>Elective B</b>
Level 3 credits	4	0-9	0-21
Level 4 credits	32	0-23	0-8
Minimum totals	36	15	10
Qualification total with strand	79		

<b>Electronic Consumer Goods Strand</b>		
	<b>Compulsory</b>	<b>Optional</b>
Level 2 credits	-	1
Level 3 credits	23	3
Level 4 credits	49	-
Minimum totals	72	0
Qualification total with strand	90	

<b>Office Equipment Strand</b>		
	<b>Compulsory</b>	<b>Optional</b>
Level 2 credits	-	1
Level 3 credits	23	3
Level 4 credits	34	-
Minimum totals	57	0
Qualification total with strand	75	

<b>Portable Electrical Appliances and Power Tools Strand</b>			
	<b>Compulsory</b>	<b>Elective A</b>	<b>Elective B</b>
Level 3 credits	4	0-6	0-17
Level 4 credits	32	0-21	0-8
Minimum totals	36	15	10
Qualification total with strand	79		

## Requirements for the Award of Qualification

This qualification will be awarded to people credited with all of the core compulsory unit standards and who have met the requirements of one of the strands.

### Core Compulsory

- All the unit standards listed are required.

### Commercial Electrical Appliances Strand

- All unit standards listed in the strand compulsory
- A minimum of 15 credits from strand Elective A
- A minimum of 10 credits from strand Elective B

### Domestic Electrical Appliances Strand

- All unit standards listed in the strand compulsory
- A minimum of 15 credits from strand Elective A
- A minimum of 10 credits from strand Elective B

### Electronic Consumer Goods Strand

- All unit standards listed in the strand compulsory
- Optional unit standards depending on employment contexts

### Office Equipment Strand

- All unit standards listed in the strand compulsory
- Optional unit standards depending on employment contexts

### Portable Electrical Appliances and Power Tools Strand

- All unit standards listed in the strand compulsory
- A minimum of 15 credits from strand Elective A
- A minimum of 10 credits from strand Elective B

## Requirements for Award of Qualification

#### Award of NZQF National Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided on the New Zealand Qualifications Authority (NZQA) website: <http://www.nzqa.govt.nz/qualifications-standards/standards/standards-exclusion-list/>.

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (ID). Any version of a standard with the same ID may be used to meet qualification requirements that list the ID and/or that specify the past or current classification of the standard.

## Detailed Qualification Requirements

### Core Compulsory

All the unit standards listed below are required.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Core Electrical

Id	Title	Level	Credit
15861	Demonstrate knowledge of direct current (d.c.) power supplies	3	3
15864	Demonstrate knowledge of semiconductor power devices	4	4

Domain Electrical Service Technicians

Id	Title	Level	Credit
18090	Demonstrate knowledge of alternating current (a.c.) theory for electrical service technicians	4	5
18091	Demonstrate knowledge of three-phase theory for electrical service technicians	4	3

Field Humanities  
 Subfield Communication Skills  
 Domain Writing

Id	Title	Level	Credit
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<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
3492	Write a short report	2	3

### Commercial Electrical Appliances Strand Compulsory

All unit standards listed below are required.

Field                    Engineering and Technology  
 Subfield                Electrical Engineering  
 Domain                  Electrical Appliance Servicing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
18086	Draw and interpret diagrams of electrical appliances	3	4
22764	Service electrical appliances	4	25
22767	Demonstrate knowledge of operating principles and installation requirements of commercial electrical appliances	4	7

### Commercial Electrical Appliances Strand Elective A

A minimum of 15 credits is required from the following unit standards.

Field                    Engineering and Technology  
 Subfield                Electrical Engineering  
 Domain                  Electrical Appliance Servicing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
18084	Demonstrate knowledge of refrigeration principles applicable to domestic appliances	4	6
18089	Demonstrate knowledge of domestic gas appliances for electrical appliance service technicians	4	4
20591	Braze refrigerator pipe work in electrical appliance servicing	3	3
22765	Demonstrate knowledge of microwave ovens for electrical appliance service technicians	4	4

Domain                  Electrical Service Technicians

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
17807	Demonstrate knowledge of legislation and standards for electrical service technicians – three-phase	4	4
17809	Demonstrate knowledge of single and three-phase motors for electrical service technicians	4	5
17810	Connect single and three-phase electrical appliances and fittings	3	3
17811	Test single and three-phase electrical appliances	3	3

**Commercial Electrical Appliances Strand Elective B**

A minimum of 10 credits is required from the following unit standards.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
1173	Install and commission electrical appliances	4	5
1189	Service microwave ovens	4	3
16411	Fault-find, repair, and re-commission fixed-wired electrical appliances	3	4
18087	Exhibit customer service skills in electrical appliance servicing	3	3

Subfield Electronic Engineering  
 Domain Electronic Installation and Maintenance

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
8191	Demonstrate systematic and logical fault finding techniques in electronic products or systems	3	6
8218	Carry out surface mounted device (SMD) soldering, de-soldering, and printed circuit board repair	3	8

**Domestic Electrical Appliances Strand Compulsory**

All unit standards listed below are required.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
18085	Demonstrate knowledge of the operating principles and installation requirements of domestic electrical appliances	4	7
18086	Draw and interpret diagrams of electrical appliances	3	4
22764	Service electrical appliances	4	25

**Domestic Electrical Appliances Strand Elective A**

A minimum of 15 credits is required from the following unit standards.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
18084	Demonstrate knowledge of refrigeration principles applicable to domestic appliances	4	6
18089	Demonstrate knowledge of domestic gas appliances for electrical appliance service technicians	4	4
20591	Braze refrigerator pipe work in electrical appliance servicing	3	3
22765	Demonstrate knowledge of microwave ovens for electrical appliance service technicians	4	4

## Domain Electrical Service Technicians

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
17807	Demonstrate knowledge of legislation and standards for electrical service technicians – three-phase	4	4
17809	Demonstrate knowledge of single and three-phase motors for electrical service technicians	4	5
17810	Connect single and three-phase electrical appliances and fittings	3	3
17811	Test single and three-phase electrical appliances	3	3

**Domestic Electrical Appliances Strand Elective B**

A minimum of 10 credits is required from the following unit standards.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
1173	Install and commission electrical appliances	4	5
1189	Service microwave ovens	4	3
16411	Fault-find, repair, and re-commission fixed-wired electrical appliances	3	4
18087	Exhibit customer service skills in electrical appliance servicing	3	3

Subfield Electronic Engineering  
 Domain Electronic Installation and Maintenance

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
8191	Demonstrate systematic and logical fault finding techniques in electronic products or systems	3	6
8218	Carry out surface mounted device (SMD) soldering, de-soldering, and printed circuit board repair	3	8

**Electronic Consumer Goods Strand Compulsory**

All unit standards listed below are required.

Field Engineering and Technology  
 Subfield Electronic Engineering  
 Domain Core Electronics

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
8195	Test and select batteries used in electronic applications, and select suitable chargers	3	3
8211	Demonstrate and apply knowledge of switching power supplies	4	4
20615	Use electronic test equipment	3	6

Domain Electronic Installation and Maintenance

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
8191	Demonstrate systematic and logical fault finding techniques in electronic products or systems	3	6
8218	Carry out surface mounted device (SMD) soldering, de-soldering, and printed circuit board repair	3	8
20721	Demonstrate and apply knowledge of advanced diagnostics for electronics technicians	4	5
20724	Diagnose and repair faulty consumer electronic equipment to component level	4	40

**Optional Unit Standards for Electronic Consumer Goods Strand**

The following optional unit standards are not required as part of the qualification, but may be required in some employment contexts.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
18087	Exhibit customer service skills in electrical appliance servicing	3	3

Subfield Electronic Engineering  
 Domain Core Electronics

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
5934	Prevent electrostatic damage to electronic components	2	1

**Office Equipment Strand Compulsory**

All unit standards listed below are required.

Field Engineering and Technology  
 Subfield Electronic Engineering  
 Domain Core Electronics

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
8195	Test and select batteries used in electronic applications, and select suitable chargers	3	3
8211	Demonstrate and apply knowledge of switching power supplies	4	4
20615	Use electronic test equipment	3	6

Domain Electronic Installation and Maintenance

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>
6066	Diagnose and repair faulty electronic office equipment to module level	4	25
8191	Demonstrate systematic and logical fault finding techniques in electronic products or systems	3	6
8218	Carry out surface mounted device (SMD) soldering, de-soldering, and printed circuit board repair	3	8
20721	Demonstrate and apply knowledge of advanced diagnostics for electronics technicians	4	5

**Optional Unit Standards for Office Equipment Strand**

The following optional unit standards are not required as part of the qualification, but may be required in some employment contexts.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

Id	Title	Level	Credit
18087	Exhibit customer service skills in electrical appliance servicing	3	3

Subfield Electronic Engineering  
 Domain Core Electronics

Id	Title	Level	Credit
5934	Prevent electrostatic damage to electronic components	2	1

**Portable Electrical Appliances and Power Tools Strand Compulsory**

All unit standards listed below are required.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

Id	Title	Level	Credit
18086	Draw and interpret diagrams of electrical appliances	3	4
22764	Service electrical appliances	4	25
22766	Demonstrate knowledge of the operating principles of portable electrical appliances and power tools	4	7

**Portable Electrical Appliances and Power Tools Strand Elective A**

A minimum of 15 credits is required from the following unit standards.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

Id	Title	Level	Credit
18084	Demonstrate knowledge of refrigeration principles applicable to domestic appliances	4	6
18085	Demonstrate knowledge of the operating principles and installation requirements of domestic electrical appliances	4	7
20591	Braze refrigerator pipe work in electrical appliance servicing	3	3
22765	Demonstrate knowledge of microwave ovens for electrical appliance service technicians	4	4

Subfield Electronic Engineering  
 Domain Core Electronics

Id	Title	Level	Credit
8195	Test and select batteries used in electronic applications, and select suitable chargers	3	3
8211	Demonstrate and apply knowledge of switching power supplies	4	4

## Portable Electrical Appliances and Power Tools Strand Elective B

A minimum of 10 credits is required from the following unit standards.

Field Engineering and Technology  
 Subfield Electrical Engineering  
 Domain Electrical Appliance Servicing

Id	Title	Level	Credit
1173	Install and commission electrical appliances	4	5
1189	Service microwave ovens	4	3
18087	Exhibit customer service skills in electrical appliance servicing	3	3

Subfield Electronic Engineering  
 Domain Electronic Installation and Maintenance

Id	Title	Level	Credit
8191	Demonstrate systematic and logical fault finding techniques in electronic products or systems	3	6
8218	Carry out surface mounted device (SMD) soldering, de-soldering, and printed circuit board repair	3	8

### Previous version of the qualification

Version 1 was issued to replace, along with the National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing) (Level 3) [Ref: 1265,] the National Certificate in Electrical Appliance Servicing [Ref: 0827]. Summary of differences between the qualifications: five strands created to recognise distinct skill sets; standards 750, 1178, 6401, 6402, 15843, 15848, 15849, 15851, 15856, 16407, 17808, 17798-17806, 18082, 18088, and 22763 (part replacement for standard 18083) not required in this qualification and now included in the National Certificate in Electrical Engineering (Electrical Appliance and Electronic Servicing) (Level 3) [Ref: 1265]; standard 18083 replaced by 22764; standards 1173, 1189, 5934, 6066, 8191, 8195, 8211, 8218, 16411, 17807-17811, 20591, 20615, 20721, 20724, and 22765-22767 added. The last date to have met the requirements of the former qualification was 31 December 2008.

### Other standard setting bodies whose standards are included in the qualification

NZQA

### Certification

This certificate will display the logos of NZQA, The Skills Organisation and the name of the accredited organisation.

## Classification

This qualification is classified according to the classification system listed on the Directory of Assessment Standards (DAS) and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

DAS Classification		NZSCED	
Code	Description	Code	Description
204	Engineering and Technology > Electrical Engineering	031301	Engineering and Related Technologies > Electrical and Electronic Engineering and Technology > Electrical Engineering

### Quality Management Systems

Providers and Industry Training Organisations must be granted consent to assess by a recognised Quality Assurance Body before they can register credits from assessment against standards. Organisation with consent to assess and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Consent to assess requirements and the moderation system are outlined in the associated Consent and Moderation Requirements (CMR) for each standard.

Review