Title	**Install, test, and commission a.c. rotating machines**		
Level	**4**	**Credits**	**2**

Purpose	This unit standard covers the installation and commissioning of alternating current (a.c.) motors and generators, and is for people wishing to qualify as electricians. People credited with this unit standard are able to: – prepare for installation of a.c. rotating machines; – install a.c. rotating machines; and – test and commission a.c. rotating machines.

Classification	Electrical Engineering > Electrical Installation and Maintenance

Available grade	Achieved

Guidance Information

1 This unit standard has been developed for learning and assessment on-job.

2 Definitions
CEPC – Critical Essential Performance Capabilities.
EPC – Essential Performance Capabilities.
ERAC – Electrical Regulatory Authorities Council.
EWRB – Electrical Workers Registration Board.
Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.
Safe and sound practice – as it relates to the installation of electrical equipment is defined in AS/NZS 3000:2007, *Electrical Installations (known as the Australian/New Zealand Wiring Rules).*

3 Range
a The number and type of machines chosen are left to the discretion of the assessor, but must be sufficient to assess competence in all outcomes of the unit standard.
b Candidates may refer to current legislation and Standards during assessment.
c Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.

d All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
- i legislation;
- ii policies and procedures;
- iii ethical codes;
- iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010;
- v applicable site, enterprise, and industry practice; and,
- vi where appropriate, manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Prepare for installation of a.c. rotating machines.

Performance criteria

1.1 Verify that the electrical supply is adequate.

Range may include but is not limited to – supply capacity, voltage stability, electrical interference, current capacity to meet starting, and running, current for continuous or intermittent load.

1.2 Verify that the type of machine is adequate for the operating environment.

Range typical machine types – open-frame, screen-protected, drip-proof, water-proof, totally-enclosed, fan-ventilated, non-ventilated, flame-proof, hazardous-area rated.

1.3 Inspect machines and auxiliary equipment visually for any damage sustained during transport, and if so, take follow-up action.

1.4 Remove protective coatings and coverings from the machines.

Range protective coatings may include but are not limited to – shaft clamps, vent packing, rust inhibitors, lubricant in bearings and gear boxes.

1.5 Verify operational readiness of the machine in terms of lubrication, cleanliness, insulation resistance, and equal winding resistance.

1.6 Confirm suitability of the machine foundation.

Range flat, solid, rigid, level.

1.7 Obtain installation and commissioning details from specifications, drawings, and manuals before commencement of the work.

Outcome 2

Install a.c. rotating machines.

Performance criteria

2.1 Position machines securely and align shafts to match coupling.

2.2 Make electrical connections to the machines, including cabling, glands, terminations, and accessories.

2.3 Install control and protection equipment.

2.4 Install guards and covers in accordance with specifications.

Outcome 3

Test and commission a.c. rotating machines.

Performance criteria

3.1 Test to confirm that the machines and control equipment meet all current regulations and Standards and are safe to connect.

3.2 Carry out commissioning tests and adjustments and confirm operation of control equipment is in accordance with specifications.

Range control equipment may include, but is not limited to – switch gear, metering, over-temperature, open-circuit, short-circuit, overload protection;
adjustments include, but are not limited to – phase rotation, polarity.

3.3 Carry out off-load and on-load commissioning tests of the machine.

Range direction of rotation, vibration, temperature rise, current draw.

3.4 Carry out commissioning inspection and certification and document commissioning test results.

Replacement information	This unit standard replaced unit standard 2013.

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	21 July 2016	31 December 2027
Review	2	24 March 2022	31 December 2027
Rollover and Revision	3	25 May 2023	31 December 2027

Consent and Moderation Requirements (CMR) reference	0003

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