Title	**Install and commission d.c. rotating machines**		
Level	**4**	**Credits**	**5**

Purpose	This unit standard covers the installation and commissioning of direct current (d.c.) motors and generators and is for people wishing to qualify in the electrical industry. People credited with this unit standard are able to: – prepare for installation of d.c. rotating machines; – install d.c. rotating machines; and – test and commission d.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 Achievement of this unit standard does not by itself imply that trainees may legally perform prescribed electrical work in their own right. Until they are registered and licensed under the Electricity Act 1992, trainees are assisting, and must work under the supervision of a Supervisor of Electrical Work when carrying out prescribed electrical work. If the prescribed electrical work in question is carried out for reward the Supervisor of Electrical Work must hold a valid practising licence.

3 References
Electricity Act 1992;
Electricity (Safety) Regulations 2010;
Health and Safety at Work Act 2015;
AS/NZS 3000:2018, *Electrical installations (known as the Australian/New Zealand Wiring Rules),* including Amendment 1;
AS/NZS 3017:2007, *Electrical installations – Verification guidelines;*
and all subsequent amendments and replacements.

4 Definitions
The term *current regulations and standards* is used in this unit standard to refer to the requirements of the above references.
The term *safe and sound practice* relating to the installation of electrical equipment is defined in AS/NZS 3000:2018.

5 Range
Demonstration of *safe working practices* and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.

6 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.

Outcomes and performance criteria

Outcome 1

Prepare for installation of d.c. rotating machines.

Performance criteria

1.1 Adequacy of the electrical supply is verified.

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 Suitability of the type of machines for the operating environment is verified.

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 Machines and auxiliary equipment are inspected visually for any damage sustained during transport, and if so, follow-up action is taken in accordance with company or customer requirements.

1.4 Protective coatings and coverings are removed 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 Operational readiness of the machines is verified in terms of lubrication, cleanliness, insulation resistance, and equal winding resistance.

1.6 Suitability of foundation is confirmed.

Range flat, solid, rigid, level.

1.7 Installation and commissioning details are obtained from specifications, drawings, and manuals prior to commencement of the work.

Outcome 2

Install d.c. rotating machines.

Performance criteria

2.1 The machines are positioned securely and shaft aligned to match coupling.

Range coupling may include but is not limited to – belt and pulley, gears, direct coupling, flexible coupling.

2.2 Electrical connections are made to the machines, including cabling, glands, terminations, and accessories, in accordance with specifications and current regulations and standards.

2.3 Control and protection equipment is installed according to manufacturer's instructions, and current regulations and standards.

2.4 Guards and covers are installed in accordance with specifications.

Outcome 3

Test and commission d.c. rotating machines.

Performance criteria

3.1 All requirements of current regulations and standards have been met, and that the machines and control equipment are safe to connect are confirmed by testing.

3.2 Tests, adjustments, and confirmation of operation of control equipment are commissioned according to specifications.

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

3.3 Off-load and on-load operation of the machines are confirmed by commissioning according to specifications.

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

3.4 Inspection and certification as required by current regulations and standards, and documentation are commissioned according to company requirements.

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 April 1996	31 December 2013
Review	2	28 June 1999	31 December 2013
Review	3	26 May 2005	31 December 2027
Rollover and Revision	4	15 March 2012	31 December 2027
Revision	5	15 January 2014	31 December 2027
Rollover and Revision	6	28 January 2021	31 December 2027
Review	7	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.