

Unit ID: 1229

Domain

ELECTRICAL INSTALLATION

Title:

**Demonstrate knowledge of direct current
(DC) machines**

Level: 3

Credits: 6

Purpose

This unit standard is intended to those who demonstrate knowledge of DC machines. People credited with this unit standard are able to demonstrate knowledge of DC generators; demonstrate knowledge of DC motors; and demonstrate knowledge of DC motor speed control.

This unit standard is intended for those who work as electricians.

Special Notes

1. Entry information:

Prerequisite

- *none*

2. This unit standard is to be delivered and assessed in the context of electrical operations and should be assessed in conjunction with other relevant technical units selected from this domain.

3. To demonstrate competence, at a minimum, evidence is required from correct explanations of operating principles direct current generators and direct motors; explanations on the different applications of these direct current machines; calculations of speed and torque for direct current motors as well as calculations of generated voltage for direct current generators.

4. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which electrical operations are carried out.

5. Glossary of terms

- '*DC machines*' refer to direct current motors and generators.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority on www.namqa.org and the Namibia Training Authority on www.nta.com.na.

Elements and Performance Criteria

Element 1: Demonstrate knowledge of DC generators

Performance Criteria

- 1.1 Effect on a conductor cutting magnetic lines of force is explained.
- 1.2 Principles of generation of direct current are explained.
- 1.3 DC generator parts are described and their uses explained.
- 1.4 Different types of DC generators including and not limited series generator, shunt generator and compound generator characteristics are described.
- 1.5 Calculations on DC generators including but not limited to generated electromotive force and back electromotive force are conducted.

Element 2: Demonstrate knowledge of DC motors

Performance Criteria

- 2.1 Effect on a current carrying conductor in a magnetic field is explained.
- 2.2 Generation of torque in a DC motor is explained.
- 2.3 DC motor parts are described and their uses explained.
- 2.4 Different types of DC motors including and not limited to series motor, shunt motor and compound motor characteristics are described.
- 2.5 Calculations on DC motors are conducted and checked.

Element 3: Demonstrate knowledge of DC motor speed control

Performance Criteria

- 3.1 Principles of motor speed control are explained.
- 3.2 Methods of speed control are described and their advantages and disadvantages identified.

Registration Data

Subfield:	Electrical Engineering
Date first registered:	24 July 2014
Date this version registered:	23 November 2023
Anticipated review:	23 November 2028
Body responsible for review:	Namibia Training Authority