

Domain	ELECTROTECHNOLOGY	Unit ID: 874
Title:	Use test equipment for electrotechnology measurements	
Level: 2		Credits: 3

Purpose

This unit standard specifies the competencies required to use test equipment for electrotechnology measurements. It includes knowledge of test equipment for electrotechnology measurements; procedures to select and prepare test equipment to perform electrical tests; procedures to use electrotechnology test equipment to test system and component, measuring techniques applied for measuring various electrotechnology quantities and maintaining test equipment. This unit standard is intended for those who work in the electrotechnology environment.

Special Notes

1. Entry information:
 - Prerequisite
 - Unit 864 - *Apply safety rules and regulations in an electrotechnology environment* or demonstrated equivalent knowledge and skills.
2. Assessment evidence may be collected from a real workplace or an appropriate simulated realistic environment in which electrotechnology operations are carried out.
3. Test equipment may includes but are not limited to multimeters, function generators, bench power supplies, oscilloscopes, hydrometer, load tester, logic probes and wattmeter. Test equipment may be analogue or digital.
4. Glossary of terms:
 - 'SANS' refers to South Africa National Standards
5. Application of test equipment may include but are not limited to tests for resistance, dc and ac voltage and current , battery, basic electronic components and continuity testing, frequency and insulation.
6. Incorrect use may include but are not limited to polarity reversal, use of wrong test equipment, incorrect connection to the circuit, incorrect range, incorrect scale selection, open circuit fuse in fused lead, broken test lead and open circuit test lead.
7. Regulations and legislation relevant to this unit standard include the following:
 - Labour Act, No. 11, 2007.
 - Occupational Health and Safety Regulations No. 18, 1997 and all subsequent amendments.
 - SANS 10142-1.

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 and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website www.nta.com.na.

Elements and Performance Criteria

Element 1: Demonstrate knowledge of test equipment for electrotechnology measurements.

Performance Criteria

- 1.1 The operation of moving coil and moving iron meters is described in terms of component parts and fundamental principles of electromagnetism.
- 1.2 Analogue test equipment is described in terms of their principles of operation, settings and their applications.
- 1.3 Digital test equipment is described in terms of their principles of operation, settings and their applications.
- 1.4 Test equipment is identified physically or in pictorial displays.
- 1.5 Correct measurement connections are explained using sketches.
- 1.6 Consequences of incorrect use of test equipment are stated.
- 1.7 Measurement accuracy, errors and instrument calibration is described.
- 1.8 The principle and use of voltage probes in measurement of electrotechnology circuits are described.
- 1.9 The description of maintenance and care for test equipment to ensure longevity is given in accordance with industry practice.

Element 2: Select and prepare test equipment to perform electrotechnology tests.

Performance Criteria

- 2.1 System and/or component test requirements are identified.
- 2.2 Correct test equipment is selected in accordance with the measurement requirements.
- 2.3 Test equipment is checked for serviceability and applicable leads are fitted where required.

- 2.4 Applicable function and range of measurement is selected in accordance with the measurement requirements.
- 2.5 Where applicable, calibration and/or zeroing is performed prior to measurements in order to validate readings.

Element 3: Use electrotechnology test equipment to test systems and components.

Performance Criteria

- 3.1 Test points and polarity are determined.
- 3.2 Correct range scales are selected for the tests.
- 3.3 Test equipment is used consistent with manufacturer's instructions.
- 3.4 Measurements for required parameters are taken and percentage of errors calculated following industry practice and safety procedures.
- 3.5 The approximate tolerance for each measurement is stated according to industry practice.
- 3.6 Data sheets are correctly used to identify component characteristics and generic equivalent components.
- 3.7 Results of measurements are recorded in accordance with industry procedures.

Element 4: Apply measuring techniques for various electrotechnology quantities.

Performance Criteria

- 4.1 Voltage, current and resistance measuring techniques are applied using a multi-meter.
- 4.2 Measurements of different waveforms, frequencies, and voltages using an oscilloscope are applied with examples.
- 4.3 Knowledge of the power supplies is applied for testing purposes.
- 4.4 Use of function generators in proving specific frequencies and waveforms is applied by means of signal measurements.

Element 5: Maintain and handle test equipment in the approved manner.

Performance Criteria

- 5.1 Test equipment is handled carefully.
- 5.2 Test equipment is set up consistent with safety procedures.
- 5.3 Test equipment is securely stored in dust-free, dry storage.

5.4 Test equipment is calibrated for accuracy checks as required by standard procedures.

Registration Data

Subfield:	Electrical Engineering
Date first registered:	18 November 2010
Date this version registered:	18 November 2010
Anticipated review:	2015
Body responsible for review:	Namibia Training Authority