

Domain**ELECTRICAL INSTALLATION****Title:****Install and commission alternating current (AC) machines****Level: 3****Credits: 6****Purpose**

This unit standard is intended for those who install and commission alternating (AC) machines. People credited with this unit standards are able to plan and prepare for work; install AC Machines; test and commission AC machines; and clean-up work area.

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

Special Notes

1. Entry information:

Prerequisite

- *Unit 1157 - Demonstrate basic knowledge of workplace health and safety*

2. To demonstrate competence, at a minimum, evidence is required of identifying components, install and commission AC Machines. In performing these tasks ensure correct identification of requirements and finishing of the tasks, correct selection and use of appropriate processes, tools and equipment and completing all work to specification.

3.

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

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

6. All inspection, operation and maintenance procedures associated with the use of tools and apparatus shall comply with manufacturers' and company guidelines, instructions, and reasonable flat rate time.

7. Glossary of terms

- *Commissioning* refers to the pre-determined sequence of inspections, test and energizing procedures designed for the integration of new apparatus into a power system.
- *'Isolation and lockout procedures'* refer to isolating an electrical circuit from the source of supply
- *'Specifications'* refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements, national and international standards and legislations
- *'ISO'* refers to International Organization for Standards

- 'SANS' refers to South African National Standards
 - 'DC machines' refers to direct current machines
 - 'AC machines' refers to alternating current machines.
8. Regulations and legislation relevant to this unit standard include the following:
- Labour Act No. 11 of 2007
 - Petroleum Products and Energy Amendment Act No. 2 of 2005
 - National Energy Fund Act of 2000
 - Gas Act (Draft 2b)
 - Regulations relating to the health & safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007 and all subsequent amendments.
 - ISO 14001 (Environmental Management Standard)
 - Electricity Act No.4 of 2007
 - SANS 10142-1 and SANS 10142-2 electrical wiring codes and all subsequent amendments to any of the above.

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: Plan and prepare for work

Performance Criteria

- 1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and interpreted.
- 1.2 Signage and barricade requirements are identified and implemented, where necessary.
- 1.3 Personal Protective Equipment are selected in line job and safety requirements
- 1.4 Tools and equipment selected to carry out tasks are consistent with job requirements, checked for serviceability, and any faults are rectified or reported prior to commencement.
- 1.5 The rated electrical supply is verified as per nameplate information and manufacturer' specification.
- 1.6 The machines are selected and verified to suit the operating environment.

- 1.7 The suitability of the machine foundation is inspected.
- 1.8 Installation and commissioning details are obtained from manufacturer' specifications, drawings, and manuals before commencement of the work.
- 1.9 Material quantity requirements are calculated in line with plans, specifications and quality requirements.
- 1.10 Environmental protection requirements are identified and applied in line with environmental plans and regulatory obligations.

Element 2: Install AC Machines

Range

Machine types may include but not limited to open-frame, screen-protected, drip-proof, water-proof, totally-enclosed, fan-ventilated, non-ventilated, flame proof, hazardous-area rated.

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

Performance Criteria

- 2.1 Machines and auxiliary apparatus are visually inspected for any damage sustained during transport, and appropriate action is taken.
- 2.2 Protective coatings and coverings are removed from the machines.
- 2.3 Operational readiness of the machine is verified in terms of lubrication, cleanliness, insulation resistance, and equal winding resistance.
- 2.4 Machines are positioned securely and shafts are aligned to match coupling.
- 2.5 Machines are electrically connected as per specifications.
- 2.6 Control and protection apparatus are installed.
- 2.7 Guards and covers are fitted in accordance with specifications

Element 3: Test and commission AC machines

Range

Control apparatus 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

Performance Criteria

- 3.1 Machines and control apparatus are tested to confirm that they comply with all electrical regulations and standards.
- 3.2 Commissioning and adjustments are carried out to confirm operation of control apparatus are in accordance with specifications.
- 3.3 Off-load and on-load tests are carried out.
- 3.4 Commissioning results are verified and certificate of compliance is issued in accordance with company requirements.
- 3.5 Work is completed and appropriate personnel notified in line with work place procedures.

Element 4: Clean-up work area

Performance Criteria

- 4.1 Work area is cleared, cleaned, restored and secured in line with workplace procedures.
- 4.2 Tools and equipment are cleaned, checked and stored in line with manufacturer specifications and workplace procedures.
- 4.3 Materials and wastes are disposed of, reused, or recycled in accordance with legislation, regulations, codes of practice and job specifications.

Registration Data

Subfield:	Electrical Engineering
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