Relevant Occupation/trade title: Electrician	**SAQA ID:** 91761	
Learning Area 3: Use and care of basic, portable measuring and testing equipment	**Total Hours:**	**56**
Learning Project 2: Test AC Single Phase Circuits (Lighting Circuit, Socket Outlet Circuit, Geyser Circuit, Stove Circuit and Motor Circuits)	**Total Hours:**	**8**
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):	• LA 1 (LP 2, 3, 5, 7, 9, 10) • LA3 (LP 1)	
Learning project description: Test a Variety of Single Phase Low Voltage Alternating Current Circuits		

Activity phase	Practical Skills Modules Content	Underpinning Knowledge Module Content	Work Experience Module Content	Didactical-methodological advice	Electrical Testing and Measuring Instruments
Reference to QCTO Curriculum	PM-01-PS03	KM02-KT02	WM-None		
Planning/ Preparation	**Provide access to (Given):** Electrical testing- and measuring instruments as per last column and a variety of single phase low voltage Alternating Current circuits **Apprentices must be able to do/perform the following (hard and soft) skills:** **Prepare to test AC single phase circuits** • Identify, obtain and understand OHS procedures for the given work assignment • Follow OHS risk control work preparation measures • Establish the scope of the testing/measuring to be undertaken from documentation or from	**Knowledge of:** • Different types of testing- instruments used for testing single phase circuits. • Common faults (e.g. open circuit, close circuit, continuity, voltage supply) • Safety precautions regarding correct use of electrical testing instruments used for testing single phase circuits. • PPE used during testing • Statutory requirements in relation to testing instruments • Standard operating	**Under supervision:** • Prepare testing of single phase circuits • Interpret readings and report findings • Perform risk assessment on testing equipment • Verify the functionality of various testing equipment • Store test equipment, record and report any defects • Engage in regular housekeeping activities, tool and equipment maintenance • Provide work documentation, verbal and written reports as	• Research /Desk study • Case studies /scenarios • Technical discussions • Lecture/ instructions • Presentations • Textbook work	**Print materials, electronic files, software applications incl.:** • OHS Act • Text books • Manufacturer catalogues and manuals • Training manuals for trainers and apprentices incl. multimedia software • Set of presentation aids (videos, slides) for overhead or LED/LCD projectors **Hand- & power tools and PPE incl.:** • Standard electrician's toolbox • Standard PPE

	appropriate personnel • Seek advice from the appropriate personnel to ensure the work is coordinated effectively with others • Identify and access electrical installations and equipment that may be required for the work • Obtain tools and equipment to carry out the work and check them for correct operation and safety • Identify and select correct measuring instrument needed for testing a variety of single phase AC circuits • Test functionality of testing equipment and report malfunctions to appropriate personnel • Observe warnings relating to working with precision testing/ measuring instruments and devices • Select and correctly fit personal protective equipment (PPE)	procedures for testing instruments • AC single phase circuits • OHSA, Mining Act, Municipal By-laws • Testing and measuring techniques • Lock out procedures • Methods for reading, interpretation and calculation of measurement results **<u>Range of electrical tests to be performed include:</u>** • Presence of Voltage • Polarity (Interruption of phase conductor) • Continuity tests • Insulation Resistance Tests • Reporting requirements and work documents related to AC single phase circuits • Housekeeping procedures	required by the company		**Measuring and testing instruments incl.:** • Digital /Analogue MultiMeter • Clamp meter • Voltage, line and continuity tester • AC Leakage current clamp meter **Training workshop and laboratory equipment incl.:** • Heavy workbench with stool, power supply and assembly vice • Bench mountable interchangeable training panel frame • Basic panel systems for practicing measuring and testing of fixed installations and electrical appliances with built in fault simulator exercises • Modular experimental box system with industrial machines, appliance simulators, lighting circuits and systems, socket outlet circuits, equipped distribution boards and control panels for testing/ measuring and fault finding exercises

					• Training packages for the use of measuring instruments • Set of various components / circuits & equipment for testing including: – Lighting Circuit – Socket Outlet Circuit – Geyser Circuit – Stove Circuit – Single phase AC motor
Implementation/ Execution	**Identify, inspect and test single-phase alternating current circuits** • Follow risk control measures and procedures for carrying out the work • Correctly use appropriate personal protective equipment (PPE) • Ensure that the circuit /installation is isolated and locked out • Determine the need to test or measure under power on conditions in exact accordance with OHSA • Conduct measurements/ testing (under power on – with supervision/power off conditions) according to given instructions and safety procedures • Conduct testing/ measurement without damage to testing/				

	measurement instruments, circuits, the surrounding environment or services • Use established methods to measure, calculated and interpret values as they apply to single phase AC electrical circuits and identify circuit problems • Deal safely with unexpected situations with the approval of appropriate personnel				
Evaluation/ Documentation	**Complete testing and document activities** • Clean up work place • Record tests results accurately • Complete and process relevant work documentation • Report malfunctions or deficiencies in the operation of AC single phase circuits to appropriate personnel • Inspect and clean testing/ measuring instruments • Record and report any defects and malfunctions of test instruments to appropriate personnel • Store tools and equipment in assigned secure and safe location				
Total	Hours: 8				
Specialisation additions	Equipment that requires authorisation				
Assessment guidance					

- **Self-assessment**
- **Group assessment**
- **Theory test**

Criteria for assessment:

- Selecting and inspecting correct test instruments
- Conducting tests in accordance with statutory requirements
- Recording tests results accurately and completing and reporting relevant documentation in accordance with statutory requirements