

NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician				SAQA ID: 91761	
Learning Area 3: Use and care for basic portable measuring and testing equipment				Total Hours:	56
Learning Project 3: Test three-phase low voltage basic AC circuits (Welding plugs, Three phase AC Motors)				Total Hours:	8
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		<ul style="list-style-type: none"> <li>• LA 1 (LP 2, 3, 5, 7, 9, 10)</li> <li>• LA3 (LP 1, LP2)</li> </ul>			
Learning project description: Test the required three-phase low voltage AC circuit to locate a fault by using portable electrical measuring and testing equipment					
Activity phase	Practical Skills Modules Content	Underpinning Knowledge Module Content	Work Experience Module Content	Didactical-methodological advice	Learning materials/Tools and Equipment
Reference to QCTO Curriculum	PM-01-PS03	KM02-KT02	WM-None		
<b>Planning/Preparation</b>	<p><b><u>Provide access to (Given):</u></b> Electrical testing- and measuring instruments and a variety of three phase low voltage AC circuits as per last column</p> <p><b><u>Apprentices must be able to do/perform the following (hard and soft) skills:</u></b></p> <p><b>Prepare to test three phase low voltage basic AC circuits</b></p> <ul style="list-style-type: none"> <li>• Follow risk control measures and procedures for carrying out the work</li> <li>• Correctly use appropriate personal protective equipment (PPE)</li> <li>• Ensure that the circuit</li> </ul>	<p><b><u>Knowledge of:</u></b></p> <ul style="list-style-type: none"> <li>• Common faults (e.g. open circuit, close circuit, continuity, voltage supply)</li> <li>• Basic techniques of fault finding</li> <li>• Electrical tests to be carried out on three phase low voltage AC circuit, including phase rotation.</li> <li>• Statutory requirements in relation to testing instruments</li> <li>• PPE in the use of testing and measuring equipment</li> <li>• Standard operating procedures for testing instruments</li> <li>• OHSA, Mining Act, Municipal</li> </ul>	<p><b><u>Under supervision:</u></b></p> <ul style="list-style-type: none"> <li>• Select appropriate PPE</li> <li>• Be actively involved where three-phase low voltage AC circuits are tested</li> <li>• Perform risk assessment prior to testing three-phase low voltage AC circuits</li> <li>• Ensure that test instruments are in working condition</li> <li>• Correctly store test instruments on completion</li> <li>• Engage in regular housekeeping activities, tool and equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Research /Desk study</li> <li>• Case studies /scenarios</li> <li>• Technical discussions</li> <li>• Lecture/ instructions</li> <li>• Presentations</li> <li>• Textbook work</li> </ul>	<p><b>Print materials, electronic files, software applications incl.:</b></p> <ul style="list-style-type: none"> <li>• OHS Act</li> <li>• Text books</li> <li>• Manufacturer catalogues and manuals</li> <li>• Training manuals for trainers and apprentices incl. multimedia software</li> <li>• Set of presentation aids (videos, slides) for overhead or LED/LCD projectors</li> </ul>

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	<p>/installation is isolated and locked out</p> <ul style="list-style-type: none"> <li>• Determine the need to test or measure under power on conditions in exact accordance with OHSA</li> <li>• Conduct measurements/ testing (under power on – with supervision/power off conditions) according to given instructions and safety procedures</li> <li>• Conduct testing/ measurement without damage to testing/ measurement instruments, circuits, the surrounding environment or services</li> <li>• Use established methods to measure, calculated and interpret values as they apply to AC electrical circuits and identify circuit problems</li> <li>• Deal safely with unexpected situations with the approval of appropriate personnel</li> </ul>	<p>By-laws</p> <ul style="list-style-type: none"> <li>• Test procedures on low voltage three phase AC circuit</li> <li>• Reading of measurements and correct interpretation</li> <li>• Lock out procedures On low voltage three-phase low voltage AC circuit</li> <li>• Reporting requirements and work documents related to the testing of three phase AC circuits</li> <li>• Housekeeping procedures</li> </ul>	<p>maintenance</p> <ul style="list-style-type: none"> <li>• Provide work documentation, verbal and written reports as required by the company</li> </ul>		<p><b>Hand- &amp; power tools and PPE incl.:</b></p> <ul style="list-style-type: none"> <li>• Standard electrician’s toolbox</li> <li>• Standard PPE</li> </ul> <p><b>Measuring and testing instruments incl.:</b></p> <ul style="list-style-type: none"> <li>• Multi-meter</li> <li>• Insulation resistance tester</li> <li>• Clamp on ammeter (Tong tester)</li> <li>• Line tester,</li> <li>• Phase rotation tester</li> </ul> <p><b>Training workshop and laboratory equipment incl.:</b></p> <ul style="list-style-type: none"> <li>• Heavy workbench with stool, power supply and assembly vice</li> <li>• Bench mountable interchangeable training panel frame</li> <li>• Basic panel systems for practicing measuring and testing of fixed installations and electrical appliances with built in fault simulator exercises</li> <li>• Modular experimental box system with</li> </ul>
<p><b>Implementation/ Execution</b></p>	<p><b>Test three phase low voltage AC circuits and identify problems</b></p> <ul style="list-style-type: none"> <li>• Follow risk control measures and procedures for carrying out the work</li> <li>• Correctly use appropriate personal protective equipment (PPE)</li> <li>• Ensure that the circuit</li> </ul>				

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<p><b>Evaluation/ Documentation</b></p>	<p><b>Complete testing and document activities</b></p> <ul style="list-style-type: none"> <li>• Clean up work place</li> <li>• Record tests results accurately</li> <li>• Complete and process relevant work documentation</li> </ul>				

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	<ul style="list-style-type: none"> <li>• Report malfunctions or deficiencies in the operation of low voltage three phase AC circuits to appropriate personnel</li> <li>• Inspect and clean testing/ measuring instruments</li> <li>• Record and report any defects and malfunctions of test instruments to appropriate personnel</li> <li>• Care and store tools and equipment.</li> </ul>				
<b>Total</b>	Hours 8				
<b>Specialisation additions</b>	Equipment that requires authorisation				
<b>Assessment guidance</b>					
<ul style="list-style-type: none"> <li>• <b>Self assessment</b></li> <li>• <b>Observation</b></li> <li>• <b>Checking documentation and conclusion</b></li> <li>• <b>Theory test</b></li> </ul> <p><b>Criteria for assessment:</b></p> <ul style="list-style-type: none"> <li>• Interpreting job instructions correctly and determining sequence of operation</li> <li>• Selecting portable measuring and testing equipment correctly according to the task</li> <li>• Checking portable electrical measuring instruments for correct operation and functionality</li> <li>• Identifying and marking unsafe and faulty measuring equipment for repair</li> <li>• Setting up portable measuring instruments correctly for application</li> <li>• Reading portable measuring instruments correctly and recording readings on the appropriate documentation</li> <li>• Using electrical measuring instruments in accordance with their specifications</li> <li>• Placing and storing electrical measuring instruments in accordance with specifications</li> </ul>					