

NOCC-A21 Electrician: Competence Package

Relevant Occupation/trade title: Electrician			SAQA ID: 91761		
Learning Area 7: Install wire, test and maintain electrical motors and associated control systems - Basic			Total Hours:		56
Learning Project 2: Test and maintain electrical motor and associated control systems (three phase)			Total Hours:		20
Requisite learning areas/projects to be in place (Pre-requisite and co-requisite):		<ul style="list-style-type: none">LA6LA7 LP1			
Learning project description: Test and maintain electrical motor and associated control systems (three phase)					
Activity phase	Practical Skills Modules Content	Underpinning Knowledge Module Content	Work Experience Module Content (Exposure to be given)	Didactical-methodological advice	Learning materials/Tools and Equipment
Reference to QCTO Curriculum	PM-01 (PS01, 02,03) PM-02 (PS01, 02,03) PM-06-PS02 PM-08 (PS01, 02,03,04,05)	KM-06 (KT01, 02,03) KM-07 (KT01, 02,03,04,05,06) KM-08 (KT01) KM-09 (KT01)	WM-03 (WE01, 02,03) WM-05 (WE01, 02,03)		
Planning/Preparation	<p><u>Provide access to (Given):</u> Fault finding panels, faulty switches, blown fuses, broken circuit breakers, open circuit coils, short circuited coils (three phase)</p> <p><u>Apprentices must be able to do/perform the following (hard and soft) skills:</u></p> <ul style="list-style-type: none">Select and wear PPERead and interpret task instructionsConduct risk assessmentSelect the correct tools and equipmentTransport tools and equipment to workstation safely	<p><u>Knowledge of:</u></p> <p>Preventative Maintenance</p> <ul style="list-style-type: none">Work permits and lockout proceduresPreventative maintenance on motors and control systems. (Activities include: inspecting, cleaning, repairing and replacing components if required. Tightening loose connections, conducting mechanical inspections and electrical tests. <p>Troubleshooting</p> <ul style="list-style-type: none">Work permits and lockout proceduresDiagnostic methodologies of the following: power on/off, continuity, open and short circuits, motor tests	<p><u>Under supervision:</u></p> <p>Preventative maintenance (three phase)</p> <ul style="list-style-type: none">Complete work permit and lockout procedure for motors and control systemsPerform preventative maintenance on motors and control systems as specified on job card.Clean, repair or replace components that are in a poor condition <p>Trouble shooting (three phase)</p> <ul style="list-style-type: none">Clarify with supervisor what the nature of the fault isInspect motors and control systems and diagnose nature of the problem using the following methods:<ul style="list-style-type: none">by testing the power supplyOperating/testing motors and	Lecture, presentations DVDs, audio-visual Group/Individual work Internet research Practical simulation work	<p>Print materials, electronic files, software applications incl.:</p> <ul style="list-style-type: none">Training manuals for trainers and apprentices incl. multimedia softwareSet of presentation aids (videos, slides) for overhead or LED/LCD projectors <p>Tools, equipment and materials incl.:</p> <p>Range of materials and tools to be covered (minimum): Electrical toolbox</p>

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Implementation/ Execution Repair	<ul style="list-style-type: none">Perform lock-out proceduresService and maintain motors and control systemsTrace faults on electric motors and control systems (troubleshooting)Test motors and control systems	<ul style="list-style-type: none">and control system testsMeasuring equipmentWiring diagramsTypical motor faults. Range: (Reasons for motor faults include: high noise levels, overheating of bearings, intense vibration on bearings, motor windings overheating, brush sparking, slip ring motor operate at low speed with external resistance disconnected)	<ul style="list-style-type: none">control systems to localise fault<ul style="list-style-type: none">Reading and interpreting wiring diagramConducting power on and power off testTesting control circuitTrace fault on control and main circuit of electrical motors and control systems by using measuring instruments and wiring diagramsRepair or replace faulty components, switches, over-load devices, over-current protection devices, conductors and motorsTest motors and control systems for correct operationComplete job card		Materials: <ul style="list-style-type: none">FusesFuse wireSwitches, limits, pressure switches, sensorsoverload protectionover-current protectioncontactorscircuit breakers Equipment: <ul style="list-style-type: none">Installation resistance testerMutli meter- buzzerVoltage line tester
Evaluation/ Documentation	<ul style="list-style-type: none">Evaluate the correctness of the completed task according to instructionsReport work progress to appropriate personnelInspect and clean toolsStore and secure tools and materialsComplete applicable work documentationPerform housekeeping	<ul style="list-style-type: none">Typical control system faults. Range (blown fuses, circuit breaker trips, overload trips, contactor coil burn out, contactor points fused or open circuits, emergency stop button is pushed in, faulty sensors, limit switch, pressure switch).			
Total	Hours: 20				
Specialisation additions	Equipment that requires authorisation				
Assessment guidance					
Criteria for assessment: <ul style="list-style-type: none">Correct PPE is wornRisk assessment undertakenWork permit completedLock out and safety procedures are followedMotor and/or control system tested to ensure functionalityTask is completed as per job cardHousekeeping undertaken					