



Australian Government

Department of Education, Employment and Workplace Relations

MEM18093B Maintain and repair integrated industrial refrigeration and/or large air handling system controls

Release: 1

MEM18093B Maintain and repair integrated industrial refrigeration and/or large air handling system controls

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit covers repairing/replacing integrated industrial refrigeration and/or air handling system controls.
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Application of the Unit

Application of the unit	<p>This unit applies to installation, adjustment, repairs, replacements and overhauls undertaken to site or manufacturers' specifications, using application of principles of industrial refrigeration and/or air handling systems control sequencing which may include: PLCs relay logic control systems, unitised/modular sensors, transducers, timers, counters and associated equipment. In applying this competency, system circuit components are identified, traced, inspected and operational function is assessed and verified using refrigeration/air conditioning principles to predetermined specifications interpreted for data sheets and circuit diagrams. The application of this competency must cover a variety of refrigeration equipment and systems.</p> <p>Band: B Unit Weight: 8</p>
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM10002B	Terminate and connect electrical wiring
	MEM12002B	Perform electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18049C	Disconnect/reconnect fixed wired equipment up to 1000 volts a.c./1500 volts d.c.
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM18086B	Test, recover, evacuate and charge refrigeration systems
	MEM18090B	Maintain and repair industrial refrigeration systems and components
Path 2	MEM09002B	Interpret technical drawing
	MEM10002B	Terminate and connect electrical wiring
	MEM12002B	Perform electrical/electronic measurement
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18049C	Disconnect/reconnect fixed wired

Prerequisite units		
		equipment up to 1000 volts a.c./1500 volts d.c.
	MEM18055B	Dismantle, replace and assemble engineering components
	MEM18086B	Test, recover, evacuate and charge refrigeration systems
	MEM18089B	Maintain and repair central air handling systems

Employability Skills Information

Employability skills	This unit contains employability skills.
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Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Install/replace refrigeration/air handling system controls	1.1. Refrigeration/air handling control principles and system diagrams are interpreted. 1.2. Control system/circuit components are identified and inspected for compliance to specifications. 1.3. Sequential installation is undertaken according to manufacturers' specifications and standard operating procedures.
2. Check and adjust refrigeration/air handling system control sequence and operation	2.1. The temperature, quality, pressure and properties of the air delivered by the air handling system is checked for conformance to specification. 2.2. Controls and system operation are checked against operational specifications using appropriate test equipment and application of principles/techniques. 2.3. Adjustments are performed to sequence system to meet/align to operational requirements and specifications. 2.4. Modifications/alterations are recorded and reported in accordance with standard operating procedures. 2.5. Controls and system operation are checked and commissioned to specifications.
3. Fault find refrigeration/air handling system control circuits	3.1. Control system/circuit diagrams and data sheets are interpreted. 3.2. Control system/circuit components are identified and inspected. 3.3. Control system/circuit is traced and action of components is diagnosed to identify and localise faults. 3.4. Control system/circuit parts are tested using appropriate test equipment and application principles. 3.5. Control system/circuit parts are assessed against operational specification. 3.6. Fault condition is localised at the component level. 3.7. Faulty condition is evaluated, root cause is analysed and corrective action is planned.
4. Maintain, repair/replace system control components	4.1. Correct maintenance procedures are applied according to standard operating procedures. 4.2. Repair procedures are selected and applied using correct and appropriate techniques, tools and equipment. 4.3. Faulty items are tested, repaired or replaced using sequential installation procedures according to manufacturers' specifications.

ELEMENT	PERFORMANCE CRITERIA
	4.4.Replacement items are selected from manufacturers' catalogues to meet specifications. 4.5.System control components are reassembled using appropriate principles and procedures according to specification.

ELEMENT	PERFORMANCE CRITERIA
5. Check and adjust sequence of refrigeration/air handling system controls	5.1. Using circuit diagram and refrigeration/air handling system control principles, circuit sensors and controllers are identified. 5.2. Necessary adjustments are made to sequence system control circuit to meet operational specification. 5.3. Correct operation of system control circuit is checked and confirmed against operational specification. 5.4. Refrigeration/air handling system controls are commissioned to specification. 5.5. Appropriate follow-up procedures are adopted. 5.6. Service/maintenance report is completed to standard operating procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

Required skills

Look for evidence that confirms skills in:

- using tools, techniques and equipment necessary to check integrated industrial refrigeration and/or large air handling system controls for correct operation
- obtaining, reading and interpreting specifications
- comparing system and component/circuit control performance/operation against specification
- identifying faulty components and non-compliances
- making required adjustments to achieve specifications
- sourcing and using relevant catalogues/lists
- applying safety procedures, standard operating procedures and legislative requirements to all work undertaken
- documenting results of the adjustments
- reading, interpreting and following information on written job instructions, specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- planning and sequencing operations
- checking task-related information
- undertaking calculations and numerical operations within the scope of this unit

REQUIRED SKILLS AND KNOWLEDGE

Required knowledge

Look for evidence that confirms knowledge of:

- safe work practices and procedures
- system operational requirements and specifications
- application of common refrigeration/air handling system components and controllers
- importance of following installation procedures in terms of control operation, safety and reliability
- measuring instruments/equipment and specifications for checking air temperatures, air flows, air quality and air properties
- procedures for reporting non-conformances
- refrigeration/air conditioning test equipment and application
- operational sequence of systems
- typical adjustments to correct sequencing variations from specification
- procedures for recording/reporting modifications/alterations
- typical causes of component failure
- procedures for rectifying faulty conditions
- maintenance schedule and procedures
- common adjustments that can be made to control systems and their effect
- procedures for returning to service or commissioning refrigeration/air handling control systems
- maintenance/service recording/reporting requirements
- hazard and control measures associated with maintaining and repairing integrated industrial refrigeration and/or large air handling system controls, including housekeeping

Evidence Guide

EVIDENCE GUIDE	
<p>The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.</p>	
<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to maintain and repair integrated industrial refrigeration and/or large air handling system controls. Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p>
<p>Context of and specific resources for assessment</p>	<p>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the repair/replacement of integrated industrial refrigeration and air handling systems, or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p>Method of assessment</p>	<p>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes,</p>

EVIDENCE GUIDE

	standards, manuals and reference materials.
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EVIDENCE GUIDE	
Guidance information for assessment	

Range Statement

RANGE STATEMENT	
<p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p>	
Test equipment	Multimeter, ammeter, megohm meter, cable analyser, pressure gauges
Adjustments	Pressure controls, timers, thermostats
Modifications/alterations	Pressure control settings, timer settings, thermostat settings. Must comply with manufacturers' specifications. Must be documented in site drawings/documents
Maintenance procedures	Testing of all control sequences, testing of all safety devices
Corrective action	Replacement, repair, adjustment

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	
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Co-requisite units		

Competency field

Competency field	Maintenance and diagnostics
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