



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **MEM10013A Install split air conditioning systems and associated pipework**

**Release: 1**

## MEM10013A Install split air conditioning systems and associated pipework

### Modification History

Not Applicable

### Unit Descriptor

<b>Unit descriptor</b>	This unit covers installing split air conditioning systems to relevant standards, codes and local regulations.
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### Application of the Unit

<b>Application of the unit</b>	<p>This competency unit is limited to split air conditioning applications only.</p> <p>The unit includes safe working practice and following standard procedures and manufacturer instructions to install split air conditioning equipment.</p> <p>For commissioning and decommissioning of split air conditioning systems unit MEM18084A should also be selected.</p> <p>This unit refers to plug in applications only. Where the installation and connection to mains supply of fixed wiring is necessary then this work must be undertaken by a suitably licensed person</p> <p>Persons competent in and undertaking work covered by this unit are required to hold the national restricted split system installation and decommissioning license.</p> <p><b>Band: A</b> <b>Unit Weight: 6</b></p>
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### Licensing/Regulatory Information

Not Applicable

## Pre-Requisites

Prerequisite units		
<b>Path 1</b>	MEM05006B	Perform brazing and/or silver soldering
	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM18001C	Use hand tools
	MEM18002B	Use power tools/hand held operations
	MEM18055B	Dismantle, replace and assemble engineering components

## Employability Skills Information

<b>Employability skills</b>	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. Locate split air conditioning components	1.1. Required split air conditioning unit, piping and other components are identified from job and manufacturer specifications and diagrams. 1.2. The location of unit components, piping and drains is determined in consultation with customer and other site considerations. 1.3. Industry and local authority requirements, standards and codes and manufacturer requirements are identified including the appropriate capacity rating of the equipment and any impacts on the installation are identified.
2. Inspect and prepare installation sites	2.1. All work is carried out safely to Australian Standards, state and local codes and regulations. 2.2. The installation site is prepared as appropriate to industry codes of practice and manufacturer installation instructions. 2.3. The work is carried out without damage to the system, components and the surrounding environment or services.
3. Prepare split system equipment and materials for installation	3.1. Safety hazards are identified and noted and established risk control measures are implemented. 3.2. Appropriate personnel are consulted to ensure the work is coordinated effectively with others involved on the work site. 3.3. All components, piping and fittings are properly checked for conformance to manufacturer specification, job requirements and applicable standards. The layout of the pipe work is determined from job specifications and diagrams. 3.4. Materials needed to carry out the work are obtained in accordance with established procedures and checked against job requirements. 3.5. Tools, equipment and testing devices needed to conduct the work are obtained in accordance with established procedures and checked for correct operation and safety. 3.6. Preparatory work is checked to ensure no damage has occurred and that it complies with work requirements.
4. Prepare and install refrigerant pipework	4.1. Safe work practices/risk control measures are applied as required. 4.2. Tools and equipment are used safely and in accordance with manufacturer instructions.

ELEMENT	PERFORMANCE CRITERIA
	<p>4.3. Pipework is prepared and joined to required specification with minimal wastage and damage/contamination to environment.</p> <p>4.4. Pipework and fittings are joined using appropriate pipe joining methods.</p> <p>4.5. Pipes are run separately and insulated according to manufacturer instructions and to relevant standards codes and regulations.</p> <p>4.6. Pipework and joins are checked for compliance and integrity using appropriate testing methods.</p>

## 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:

- reading, confirming and following information on written job instructions, manufacturer specifications, standard operating procedures, charts, lists, drawings and other applicable reference documents
- identifying hazards and applying safe work practices and risk control measures
- planning the installation, sequencing and coordinating work activities
- applying skills and knowledge to solve problems, deal with contingencies and unexpected events
- communicating with appropriate persons such as customer, supplier, electrical contractor
- adapting to the demands and considerations of the work environment
- sourcing components using relevant catalogues/lists
- positioning components for installation
- preparing the installation site
- checking and using applicable tools and equipment
- identifying split system air conditioning components, piping, fittings and consumables
- fabricating and joining pipework
- assembling and fixing system components
- checking pipework and units for compliance to specification
- documenting the installation and work activities

**REQUIRED SKILLS AND KNOWLEDGE****Required knowledge**

Look for evidence that confirms knowledge of:

- basic vapour compression cycle operating principles
- basic reverse cycle operating principles
- layouts, siting and set-ups of split air conditioning systems
- typical work environment, demands and considerations
- effective communication with appropriate persons
- typical problems, contingencies and solutions
- components, accessories and fixtures for split air conditioning systems
- considerations for siting units and components
- techniques and processes for site preparation
- fixing methods tools and equipment for system components and pipework
- applicable legislative requirements, standards, codes and licensing requirements for installing system components, interconnecting wiring and connection to power supply
- applicable procedures for storage, handling and treatment of ozone depleting and synthetic greenhouse gas refrigerant
- sustainable energy practices for the efficient use of materials and for minimising damage/contamination to environment
- hazards and control measures associated with installing split air conditioning systems, including housekeeping
- tools and equipment used for fabricating pipework
- pipe preparation and joining techniques including cutting, flaring, swaging, bending
- brazing/silver soldering techniques, equipment and consumables
- dry nitrogen is used during all brazing/silver soldering work
- procedures and equipment for checking pipework integrity and compliance to specification
- procedures for reporting non-conformances
- required documentation and procedures to complete and process

## Evidence Guide

<b>EVIDENCE GUIDE</b>	
<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><b>Overview of assessment</b></p>	<p>A person who demonstrates competency in this unit must be able to fabricate pipework for split air conditioning systems and install units and components to manufacturer specifications and relevant Australian Standards, codes and regulations.</p> <p>Competency in this unit cannot be claimed until all prerequisites have been satisfied.</p>
<p><b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b></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><b>Context of and specific resources for assessment</b></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 installing split air conditioning systems or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
<p><b>Method of assessment</b></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 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,</p>

<b>EVIDENCE GUIDE</b>	
	product and manufacturing specifications, codes, standards, manuals and reference materials.



**EVIDENCE GUIDE**

<b>Guidance information for assessment</b>	
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**Range Statement****RANGE STATEMENT**

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.

<b>Split air conditioning systems</b>	Single head split systems up to 18kW cooling capacity
<b>Unit components</b>	Outdoor unit, indoor unit, fittings and fixtures
<b>Site considerations</b>	Inside wall, drains, pipe runs, exposure, access, air circulation, environment, power supply
<b>Prepared</b>	Clearing and levelling, foundations, wall fixtures, roof mounting
<b>Prepared and joined</b>	Cutting to length, flaring, swaging, bending
<b>Pipe joining methods</b>	Silver brazing/soldering
<b>Equipment and testing devices</b>	Refrigeration gauge manifold, Schraeder access valves; quick connect couplings, thermometer/thermocouple temperature measuring devices; analogue and digital vacuum measuring gauges; digital scales; refrigerant recovery unit; vacuum pump; electronic leak detectors, refrigerant containers/cylinders
<b>Industry best practice</b>	Pipe preparation and joining techniques and industry best practice for pipe brazing.
<b>Commonwealth, State and Territory legislation, regulations, standards and codes</b>	The Ozone Protection and Synthetic Greenhouse Gas Legislation Amendment Bill 2003; air conditioning residential best practice guidelines (AIRAH); State and local building regulations;

<b>RANGE STATEMENT</b>	
<b>of practice, industry guidelines</b>	Codes of Practice for domestic refrigeration and air-conditioning. (HB40)
<b>Appropriate testing methods</b>	Dimensional checks, leak tests

### Unit Sector(s)

<b>Unit sector</b>	
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### Co-requisite units

<b>Co-requisite units</b>		

### Competency field

<b>Competency field</b>	Installation and commissioning
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