



Australian Government

**UEENEEJ191A Select residential air
conditioning system equipment, components
and accessories**

Release 4

UEENEEJ191A Select residential air conditioning system equipment, components and accessories

Modification History

Release	Action	Core/Elective	Details	Points
4	Update		Update pre-requisite UEENEEE103A - Solve problems in ELV single path circuits	

Unit Descriptor

Unit Descriptor

1)

1.1) Descriptor

Scope

This unit covers the selection residential air conditioning equipment, pipe work, air distribution components and controls. It encompasses the selection of the unitary air conditioning equipment and components, system controls, refrigerant and condensate pipe work based on specifications, standards and manufacturer catalogues to determine calculated and deemed-to comply solutions and documenting all selection information. It also includes the selection and layout of the air distribution system and components.

Note: Residential air conditioning applications are those covered under the Building Code of Australia - Class 1A Residential Buildings.

Application of the Unit

Application of the Unit 4)

This unit is intended as an additional competency to relevant competencies previously acquired. It is suitable for employment-based programs under an approved

Application of the Unit 4)

contract of training or institutional based delivery at the aligned AQF 4 level.

Licensing/Regulatory Information

1.2) License to practice

The skills and knowledge described in this unit do not require a license to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships.

Note:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment. Permits may also be required for some work environments such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.
2. Compliance may be required in various jurisdictions relating to currency in First Aid, confined space, lifting and risk safety measures.

Pre-Requisites

Prerequisite Unit(s) 2)

2.1) Competencies

Granting competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed.

UEENEEJ1 29A Establish heat loads for commercial refrigeration and/or air conditioning applications

UEENEEJ1 27A Establish the thermodynamic parameters of refrigeration and air conditioning systems

UEENEEJ1 92A Analyse the psychrometric performance of HVAC/R systems

Prerequisite Unit(s)

2)

and

UEENEEJ1 93A Analyse the thermodynamic performance of HVAC/R systems

UEENEEJ1 10A Select refrigerant piping, accessories and associated controls

UEENEEJ1 03A Establish the basic operating conditions of vapour compression systems

UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace

or

UEENEEJ1 09A Verify functionality and compliance of refrigeration and air conditioning installations

UEENEEE1 01A Apply Occupational Health and Safety regulations, codes and practices in the workplace

UEENEEE1 02A Fabricate, assemble and dismantle utilities industry components

UEENEEE1 03A Solve problems in ELV single path circuits

UEENEEE1 05A Fix and secure electrotechnology equipment

UEENEEE1 07A Use drawings, diagrams, schedules, standards, codes and specifications

UEENEEE1 37A Document and apply measures to control OHS risks associated with electrotechnology work

UEENEEJ1 02A Prepare and connect refrigerant tubing and fittings

UEENEEJ1 03A Establish the basic operating conditions of vapour compression systems

UEENEEJ1 Establish the basic operating conditions of

Prerequisite Unit(s)	2)
	04A air conditioning systems
	UEENEEJ1 06A Install refrigerant pipe work, flow controls and accessories
	UEENEEJ1 07A Install air conditioning and refrigeration systems, major components and associated equipment
	UEENEEJ1 08A Recover, pressure test, evacuate, charge and leak test refrigerants
	UEENEEJ1 10A Select refrigerant piping, accessories and associated controls
	UEENEEJ1 11A Diagnose and rectify faults in air conditioning and refrigeration systems and components
	UEENEEJ1 13A Commission air conditioning and refrigeration systems
	UEENEEJ1 53A Find and rectify faults motors and associated controls in refrigeration and air conditioning systems
	UEENEEJ1 70A Diagnose and rectify faults in air conditioning and refrigeration control systems
	UEENEEJ1 94A Solve problems in low voltage refrigeration circuits
	UEENEEP0 12A Disconnect / reconnect composite appliances connected to low voltage installation wiring
	UEENEEP0 17A Locate and rectify faults in low voltage composite appliances using set procedures
	UEENEEP0 24A Attach cords and plugs to electrical equipment for connection to a single phase 230 Volt supply
	UEENEEP0 25A Attach cords, cables and plugs to electrical equipment for connection to 1000 Va.c. or 1500 Vd.c. supply

Employability Skills Information

Employability Skills 3)

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a unit Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare to select residential air conditioning system equipment and components	1.1 The extent and nature of the air conditioning installation is determined from job specifications.
	1.2 Safety and other regulatory requirements to which the air conditioning system shall comply, are identified, obtained and understood
2 Develop pipe work arrangements	2.1 The intended location of air conditioning equipment is determined from job specifications and site drawings or deemed to comply arrangements.
	2.2 Pipe work arranged to ensure safe and functional operation of the system.
	2.3 Pipe work is arranged to comply with technical standards and job specifications and requirements.

ELEMENT	PERFORMANCE CRITERIA
3 Select residential air conditioning system equipment and components	3.1 Pipe and tubing is selected for suitability for the environments in which it is to be installed
	3.2 Pipe and tubing is sized to meet air conditioning parameters and capacity requirements for the refrigerant to be used.
	3.3 Pipe and tubing quantities are determined from equipment location diagrams and job specifications.
	3.4 Air conditioning unitary equipment and components are selected to meet load requirements based on calculated or deemed-to-comply solutions.
	3.5 Air distribution components and controls are selected to meet functional, specified and regulatory requirements.
	3.6 Automatic control devices are selected to meet functional, specified, regulatory requirements. And current, voltage and IP ratings.
	3.7 Evidence is obtained that the selected air conditioning equipment and components comply with all requirements.
4 Document selection of system equipment and components	4.1 Reasons for selections made, including calculations, are documented in accordance with established procedures.
	4.2 Air conditioning installation arrangement and specifications for all selected items are documented in accordance with established procedures and forwarded to appropriate person(s).

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the essential skills and knowledge and their level, required for this unit.

Evidence shall show that knowledge has been acquired of safe working practices and selecting residential air conditioning system equipment and components.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies.

KS01-EJ191A Air conditioning system equipment and component selection

Evidence shall show an understanding of air conditioning system equipment, components and piping selection, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:

T1 Residential Air Conditioning Unitary Equipment

- Construction, operation, application and selection of:
 - room air conditioners
 - split systems – wall hang, cassettes and ducted
 - small package units
 - cooling only and reverse cycle

T2 Line sizing and design

- quick selection tables
- velocity tables
- pressure drop in lines and fittings
- oil migration stabilisation
- effect of varying system capacity
- oil traps
- liquid migration

T3 Control Systems

- Construction, operation, application and selection of:
 - cycling and safety controls
 - pressure-stats
 - thermostats,
 - de-ice controls
 - air conditioning automation systems
 - control strategies

REQUIRED SKILLS AND KNOWLEDGE

T4 Air Distribution

- Principles
 - factors affecting the design of ductwork systems
 - flexible ductwork systems
 - static, velocity and total pressure
- Pressure loss
 - friction and dynamic
 - in ducts, friction charts
 - in fittings, loss co-efficients
 - diffuser pressure loss
- System sizing
 - standard duct sizes and gauges
 - duct selection
 - fitting selection
 - air diffuser selection
 - balancing

Evidence Guide

EVIDENCE GUIDE

9) The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package. .

The Evidence Guide forms an integral part of this Unit. It must be used in conjunction with all parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment

9.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the industry-preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. In some circumstances, assessment in part or full can occur outside the

EVIDENCE GUIDE

workplace. However, it must be in accordance with industry and regulatory policy.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries risk in deeming a person competent. Sources of evidence need to be 'rich' in nature to minimise error in judgment.

Activities associated with normal everyday work influence decisions about how/how much the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practised. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

Critical aspects of evidence required to demonstrate competency in this unit

9.2)

Before the critical aspects of evidence are considered all prerequisites must be met.

Evidence for competence in this unit shall be considered holistically. Each Element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:

EVIDENCE GUIDE

- Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement
- Apply sustainable energy principles and practices as specified in the performance criteria and range statement
- Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements.
- Demonstrate an appropriate level of skills enabling employment
- Conduct work observing the relevant Anti Discrimination legislation, regulations, policies and workplace procedures
- Demonstrated consistent performance across a representative range of contexts from the prescribed items below:
 - Select residential air conditioning system equipment and components as described in 8) and including:
 - A Arranging pipe work to comply with regulatory and functional requirements.
 - B Selecting appropriate type, size and quantity of pipe and tubing
 - C Selecting air conditioning unitary equipment and components that meets load requirements
 - D Selecting air distribution components and controls that meets load requirements
 - E Selecting automatic control devices that meet functional and regulatory requirements.
 - F Documenting pipe work arrangement, specification for items selected and reasons for the selections made
 - G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

EVIDENCE GUIDE

Context of and specific resources for assessment

9.3)

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this unit.

These should be part of the formal learning/assessment environment.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

Evidence should show demonstrated competency in selecting refrigerant pipe/tube, accessories and associated controls.

Method of assessment

9.4)

This unit shall be assessed by methods given in Volume 1, Part 3 'Assessment Guidelines'.

Note:

Competent performance with inherent safe working practices is expected in the Industry to which this unit applies. This requires assessment in a structured environment which is intended primarily for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit.

Concurrent assessment and relationship with other units

9.5)

For optimisation of training and assessment effort, competency development in this unit may be arranged concurrently with unit:

UEENEE001B Use basic computer applications'

Range Statement

RANGE STATEMENT

8) This relates to the unit as a whole providing the range of contexts and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

This unit must be demonstrated in relation to the selection of residential air conditioning equipment and components, pipe work, air distribution components and controls for two different air conditioning systems. These include the following; unitary air conditioning equipment and components, system controls, refrigerant and condensate pipe work and air distribution system and components.

Generic terms used throughout this Vocational Standard shall be regarded as part of the Range Statement in which competency is demonstrated. The definition of these and other terms that apply are given in Volume 2, Part 2.1.

Unit Sector(s)

Not Applicable

Competency Field

2.2) Literacy and numeracy skills

Participants are best equipped to achieve competency in this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading	5	Writing	5	Numeracy	5
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Custom Content Section

Competency Field 5)

Refrigeration and Air Conditioning

