



Australian Government

**Assessment Requirements for UEERA0021
Design control systems for refrigeration or
heating, ventilation and air conditioning
systems**

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- understanding required operating functions and parameters from the design specification
- developing the design within the safety, regulatory and functional requirements and budget limitations
- documenting and presenting design effectively
- successfully negotiating design alteration requests
- obtaining approval for final design
- dealing with unplanned events
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including using risk control measures
- designing control systems for heating ventilation and air conditioning/refrigeration (HVAC/R) systems
- preparing to design control systems for HVAC/R.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- HVAC/R design control systems, system operating requirements, integration of electrical, electronic, pneumatic and digital controls, safe working practices and relevant standards, codes and regulations, including:
 - control systems:
 - control terminology
 - control system characteristics
 - control system diagrams and symbols
 - types of control equipment:
 - electrical:

- classification of circuits
- two position control
- floating control
- sensors
- controllers
- flow control devices
- control systems diagrams
- electronic:
 - operating principles
 - sensors
 - controllers
 - control system diagrams
- pneumatic:
 - control fundamentals:
 - pneumatic control terminology
 - definitions
 - control basics:
 - air supply
 - pilot bleed system
 - signal amplifier
 - sensing elements
 - relays and switches
 - air supply system:
 - air drying methods
 - pressure regulating valves
 - pressure reducing valves
 - system controllers:
 - thermostats
 - sensors
 - actuators
 - dampers
 - system control configuration:
 - sequence control
 - limit control
 - changeover control
 - compensated control
 - recycling control
 - pneumatic – electric control
 - control systems

- digital control systems:
 - computer-based control fundamentals
 - definitions
 - principles
- controller configuration:
 - equipment
 - zone level controllers
 - system level controllers
- controller software:
 - operating software
 - application software
- controller programming:
 - system diagrams
 - control diagrams
 - configuration
 - programming
 - initialisation
 - EMS and BMS
 - supervisory control and data acquisition (SCADA) system
 - lan and Bacnet
- applications:
 - refrigeration systems
 - HVAC systems:
 - air handling system controls
 - ventilation
 - heating
 - building airflow system control
 - airflow control
 - single and multi-zones
 - chiller boiler and distribution system
 - logic analysis
 - energy management
 - asset management
 - life cycle
 - supervisory:
 - introduction building management
 - remote building control interface and modem
 - problem-solving techniques
 - relevant industry standards, codes of practice, regulations and industry practices

- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace budget, quality, policies and procedures
- relevant workplace documentation.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in suitable simulated workplace operational situations that replicate workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>