



Australian Government

Assessment Requirements for MEM234018 Design heating, ventilation, air conditioning and refrigeration control systems

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM234018A Design heating, ventilation, air conditioning and refrigeration control systems.

Performance Evidence

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

- establishing required features of heating, ventilation and refrigeration plant and equipment
- confirming parameters of the brief or contract and providing initial advice based on discipline knowledge, standards, work health and safety (WHS), regulatory and risk assessment requirements
- researching sustainability implications and current industrial design techniques
- investigating, measuring, modelling and calculating using appropriate software and validation techniques
- investigating faults in existing designs and proposing solutions
- innovating and creating solutions, incorporating systems thinking, continuous improvement and constraint and contingency management
- designing control systems and energy management plans on at least two occasions, using current design criteria and programming building control systems software
- applying safe working practices and procedures
- communicating, negotiating and reviewing with stakeholders and client throughout the process to obtain agreement on proposal and sign-off on design
- documenting design through the production of graphics, drawings, specifications and instructions.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- contemporary engineering design methods
- heating, ventilation, air conditioning and refrigeration (HVACR) control systems
- brief or contract parameters
- energy management principles
- relevant engineering design methods

- design, research, modelling and computational methodologies applied to HVACR control systems
- design methods, research and investigations methods
- techniques for:
 - continuous improvement
 - problem solving and decision making
 - root cause analysis (RCA) or failure mode and effects analysis (FMEA) or design review based on failure mode (DRBFM), and Pareto analysis
- WHS and regulatory requirements, codes of practice, standards, risk minimisation and registration requirements
- control system principles applied to HVACR systems
- types of control equipment
- system specifications
- system hardware requirements including industrial and commercial refrigeration systems, hydronic systems and automated controls
- HVACR load cycles
- principles of building management systems (BMS) and building management control system software
- energy options including unit tariffs, system and component consumption, benchmarks for energy costs and comparative tariffs of supply authorities
- interface principles for system components
- major system hardware component control and energy requirements
- interface principles and techniques for electrical, electronic, pneumatic and hydraulic sensors and actuators.

Assessment Conditions

- Assessors must:
 - have vocational competency in designing heating, ventilation, air conditioning and refrigeration control systems at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015 or its replacement* and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.

- 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.
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Links

Companion Volume Implementation Guides are available on VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>