



Australian Government

MEM23151 Commission and optimise performance of HVACR systems

Release: 1

MEM23151 Commission and optimise performance of HVACR systems

Modification History

Release 1. Supersedes and is equivalent to MEM23151A Commission and optimise performance of HVACR systems.

Application

This unit of competency defines the skills and knowledge required to commission and optimise a heating, ventilation, air conditioning and refrigeration (HVACR) system and associated plant and equipment.

It applies to HVACR technicians in manufacturing, servicing and maintenance organisations who are required to commission HVACR systems, and as part of the commissioning process, ensure optimal performance.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

MEM23004 Apply technical mathematics

MEM23006 Apply fluid and thermodynamics principles in engineering

MEM23140 Determine operational parameters for building HVAC hydronic systems

MEM23154 Analyse and service HVACR systems

Competency Field

Engineering science

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare HVACR system for commissioning	1.1 Obtain and implement work health and safety (WHS) and environmental requirements for the work area 1.2 Determine system operating parameters by reviewing system specifications and component technical data 1.3 Identify correct building codes and local government regulations using appropriate resources

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.4 Prepare industry standard report on system performance levels using organisational procedures 1.5 Consult appropriate personnel are to ensure the work is coordinated effectively with others involved on the work site 1.6 Obtain equipment, resources and testing devices needed for the work in accordance with organisational procedures
2. Commission and optimise complex HVACR systems	2.1 Set up and connect testing and measuring devices appropriately for task and to manufacturer specifications 2.2 Measure and adjust equipment components and controls as required 2.3 Undertake required measurements and tests and analyse results to provide optimum system performance in accordance with system specifications and regulatory requirements 2.4 Provide solutions to unplanned situations consistent with organisational procedures 2.5 Ensure commissioning is carried out efficiently without waste of materials or damage to equipment and surroundings
3. Complete and report commissioning activities	3.1 Verify that plant and equipment are operating to specification 3.2 Document adjustment settings and notify appropriate personnel in accordance with organisational procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

WHS requirements	relevant legislation
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include:	• protective equipment • material safety management systems • hazardous substances and dangerous goods code • local safe operation procedures • awards provisions.
Environmental requirements include:	• relevant legislation, regulations and codes • correct handling and disposal of liquid and solid waste • elimination or minimisation of gas, fume, vapour and smoke emissions, including fugitive emissions • dust elimination, minimisation and control • minimisation of energy and water use • elimination or control of excessive noise • use and recycling of refrigerants.
Appropriate personnel include:	• supervisor, leading hand, foreman or manager • engineer • technician • trainer or mentor • team member • customer.
Plant and equipment include:	• control system • chiller • boiler • cooling tower • heat exchanger.
Resources include:	• reference manuals • scientific calculator • appropriate manuals • stationery.
Organisational procedures include:	• use of tools and equipment • instructions, including job sheets, plans, drawings and designs • reporting and communication • manufacturer specifications • operational procedures • industry standards.
Equipment includes:	• computer workstation and software, either stand alone or networked • test apparatus • appropriate tools of trade, equipment and materials.

Unit Mapping Information

Release 1. Supersedes and is equivalent to MEM23151A Commission and optimise performance of HVACR systems.

Links

Companion Volume Implementation Guides are available on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM23151 Commission and optimise performance of HVACR systems

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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:

- identifying and interpreting drawings and system specifications and commissioning requirements appropriate to the task
- implementing work health and safety (WHS) procedures and practices including the use of risk control measures
- devising a commissioning schedule and plan
- setting up and documenting commissioning tests on at least two occasions
- commissioning of HVACR systems on at least two occasions
- communicating technical and procedural requirements to others
- dealing with unexpected situations
- documenting technical information and designs in accordance with procedures.

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:

- WHS requirements
- appropriate personnel to consult
- fundamentals of HVACR systems, plant and equipment including:
 - air systems
 - hydronic systems
 - control systems
 - chillers
 - boilers and furnaces
 - cooling towers
 - heat exchangers
 - piping
 - ducts

- plant and equipment commissioning techniques and procedures including:
 - set up
 - measuring and testing
 - fault-finding
 - adjustments
 - reporting and documenting
 - commissioning schedules
- environmental requirements
- organisational procedures
- resource and equipment requirements.
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Assessment Conditions

- Assessors must:
 - have vocational competency in commissioning and optimising performance of HVACR 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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