

# Unit of Competency CPCPMS4011

## Design, size and lay out heating and cooling systems

### Application

This unit specifies the skills and knowledge required to design, size and document the layout of heating and cooling systems for multi-floor structures.

In some jurisdictions, this unit of competency may form part of accreditation, licensing, legislative, regulatory or certification requirements.

### Prerequisite Unit

Nil.

### Elements and Performance Criteria

1. Identify system requirements.	<p>1.1 Access, read and determine heating and cooling installation requirements from job specifications, relevant Australian Standards, codes, manufacturer's specifications and jurisdictional requirements.</p> <p>1.2 Identify and apply workplace policies and procedures, work health and safety (WHS) and environmental requirements.</p> <p>1.3 Determine quantity, location, fixtures and legal points of discharge.</p>
2. Design and size system layout.	<p>2.1 Review building drawings plans and specifications to determine heating and cooling requirements.</p> <p>2.2 Perform sizing of air conditioning or small-bore heating system to provide for required heating and cooling load and to determine required piping and ducting.</p> <p>2.3 Produce final system layout plans according to job specifications, relevant Australian Standards, codes, manufacturer's specifications and jurisdictional requirements.</p>

### Foundation skills

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

### Unit Mapping Information

Supersedes and is equivalent to CPCPMS4011B Design, size and lay out heating and cooling systems.

### Links

Companion Volume Implementation Guide:

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad>

# Assessment Requirements for CPCPMS4011 Design, size and lay out heating and cooling systems

## Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria for this unit by:

- designing, sizing and documenting the layout details of a domestic heating and cooling system requiring a minimum heat load of 150 megajoules (MJ) per hour
- designing, sizing and documenting the layout details of a commercial heating and cooling system for a structure with at least four floors.

The performance applies to:

- ducting systems for air conditioning, heating or ventilation purposes in buildings Class 1 or 2 with a maximum static pressure of 0.75 kPa and a maximum velocity of 12.5 metres per second
- piping systems conveying heating and chilled water operating at a maximum pressure of 700 kPa or a maximum temperature of 100°C
- systems having a maximum output of 50 kW and total air quantities not exceeding 950 litres per second.

## Knowledge Evidence

To be competent in this unit, a candidate must demonstrate knowledge of:

- principles, operation and characteristics of heating and cooling systems
- characteristics and application of different fixing and joining techniques and methods
- characteristics and application of pipe and ducting systems, including their fittings and fixture supports and fixing and joining techniques
- design concepts and performance measures for heating and cooling systems
- effective isolation processes and procedures
- electrical and electronic principles and safety requirements
- process of designing, sizing and documenting the layout of heating and cooling systems
- properties of water and air, including pressure and flow rates
- air conditioning systems:
  - evaporative cooling system
  - hydronic heating system
  - hydronic cooling system
  - warm air system
  - refrigerated air conditioning system
- small-bore heating systems:
  - boilers
  - piping

- o radiators
- design materials:
  - o use of computers and relevant computer-aided design (CAD) software
  - o drafting materials and equipment
  - o relevant structure plans and specifications
- how to access relevant information, including codes and standards
- tools, materials and equipment used to design, size and document the layout of heating and cooling systems
- work health and safety (WHS) requirements for designing, sizing and documenting the layout of heating and cooling systems.

## Assessment Conditions

Assessors must satisfy the requirements for assessors listed in the Standards for Registered Training Organisations.

This unit must be assessed in the workplace or a close simulation using realistic workplace conditions, materials, activities, responsibilities, procedures, safety requirements and environmental considerations.

## Links

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