

<b>Title</b>	<b>Pre-commission mechanical building services</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>15</b>

<b>Purpose</b>	<p>This unit standard is intended primarily for use in the training of personnel in the mechanical building services industry and covers pre-commissioning of mechanical building services to the industry standard.</p> <p>People credited with this unit standard are able to: prepare for pre-commissioning of mechanical building services; pre-commission water side of mechanical building services; pre-commission air side of mechanical building services.</p>
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<b>Classification</b>	Mechanical Engineering > Heating, Ventilating, and Air Conditioning
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<b>Available grade</b>	Achieved
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### Guidance Information

- 1 Unit 26329, *Pre-commission mechanical building services under supervision* is recommended for entry into this unit standard.
- 2 Reference and legislation  
Health and Safety at Work Act 2015.  
NZS 4219:2009, *Seismic performance of engineering systems in buildings*.
- 3 Definitions  
*Accepted industry practice* refers to approved codes of practice and standardised procedures accepted by the mechanical building services industry sector as examples of best practice.  
*Pre-commissioning* includes those checks and procedures required to ensure proper equipment functionality and integration of components.  
*Specifications* refer to documentation that include technical standards, documented operating and maintenance procedures or instructions for the system, installation drawings, manufacturers' data, installation instructions, installation programme schedules, material schedules, and site instructions.  
*Workplace procedures* refer to procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

#### 4 Range

Air conditioning and ventilation system includes – large central air conditioning systems, ducted constant-flow rate and variable-flow rate air conditioning systems, packaged and split air conditioning, heat pumps, supply and extract ventilation systems, fume ventilation, industrial ventilation systems.

Chilled water system includes – plain water, brine, glycol systems.

Gas system includes – medical gases, LPG, CNG, oxygen, acetylene, compressed air, natural gas.

Hot water heating systems include – low, medium, and high temperature systems.

Industrial liquids systems include – dry goods systems such as grains, industrial fluids systems such as inks, systems for slurries such as whey milk products, pelletized bed systems.

Industrial liquids may include – acids, alkalis, detergents, printing inks, food products.

Steam and condensate systems include – systems that use gas, coal, oil, or electricity as fuel sources for the heating system components.

Evidence is required of pre-commissioning of: an air conditioning and ventilation system, a chilled water system, and a hot water heating system, and one from – an industrial liquid system, a steam and condensate system, a gas system.

#### 5 Assessment information

- a Evidence may be gathered by the candidate over several work sites and may need to be spread between several time periods. There will typically be jobs where part of the job is completed in conjunction with other mechanical building services personnel. The evidence relates to the candidates own specific work, not work jointly performed with other team members, except where the other team member is checking or assessing the candidate.
- b All new installations or extension to existing systems and upgrades should meet local Territorial Authority requirements, and seismic performance stipulated by NZS 4219.
- c All activities must comply with applicable workplace procedures and must be consistent with accepted industry practice.

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## Outcomes and performance criteria

### Outcome 1

Prepare for pre-commissioning of mechanical building services.

### Performance criteria

- 1.1 Pre-commissioning procedures are planned with reference to specifications and design, and includes the interface with other trades.
- 1.2 Equipment, tools, and other resources required for pre-commissioning are arranged.
- 1.3 A certificate of compliance or a producer statement is obtained to verify the system installation including upgrades and extensions meeting seismic requirements.

- 1.4 Chemicals to be used for cleaning and flushing are identified, and the correct mixing technique and hazard management are included in the plan.
- 1.5 Quality assurance sheets are completed and verified by an authorised person.

## Outcome 2

Pre-commission water side of mechanical building services.

Range may include but is not limited to – flush and clean pipes, install and clean strainers and filters, check correct rotation of motors, ensure valves are installed and fitted in the correct way, verify operation of valves, check pipe is insulated as required, check condensate drain, check damper movement, check water valve open correctly, check all meters and gauges are installed as required, check and verify all controllers are functional, verify control functions, check interface with other trades are functional.

## Performance criteria

- 2.1 Installation of system is checked for compliance with shop drawings and specifications.
- 2.2 Required services are identified and checked in accordance with specifications.
- Range services may include but not limited to electricity, water, gas.
- 2.3 Pre-commissioning procedures are completed in accordance with the plan.
- 2.4 Non-conformance of systems are notified.
- 2.5 Any wall and ceiling penetrations made during the installation of mechanical building services components and system are checked for compliance against specifications and plans.
- 2.6 Any elements requiring seismic restraint are checked for compliance against specifications and plans.
- 2.7 The systems are verified as being ready for commissioning.
- 2.8 Pre-commissioning report is completed and handed to project manager.

## Outcome 3

Pre-commission air side of mechanical building services.

Range may include but is not limited to – flush and clean pipes, install and clean filters, check correct rotation of motors, check dampers are installed as required and their operation are correct, check all meters and gauges are installed as required, check controllers are functional, verify control functions, check interface with other trades are functional.

**Performance criteria**

- 3.1 Installation of system is checked for compliance with shop drawings and specifications.
- 3.2 Required services are identified and checked in accordance with specifications.  
Range services may include but not limited to electricity, water, gas.
- 3.3 Pre-commissioning procedures are completed in accordance with the plan.
- 3.4 Non-conformance of systems are notified.
- 3.5 Any wall and ceiling penetrations made during the installation of mechanical building services components and system are checked for compliance against specifications and plans.
- 3.6 Any elements requiring seismic restraint are checked for compliance against specifications and plans.
- 3.7 The systems are verified as being ready for commissioning.
- 3.8 Pre-commissioning report is completed and handed to project manager.

<b>Replacement information</b>	This unit standard replaced unit standard 3246, unit standard 3247, unit standard 3248, unit standard 3249, unit standard 3250, unit standard 3251, unit standard 3252, and unit standard 3253.
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<b>Planned review date</b>	31 December 2023
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	16 July 2010	31 December 2023
Review	2	29 March 2018	N/A

<b>Consent and Moderation Requirements (CMR) reference</b>	0013
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**Comments on this unit standard**

Please contact Competenz [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.