

Title	Install commercial refrigeration and/or air conditioning systems		
Level	4	Credits	20

Purpose	<p>This unit standard is for people who work in the refrigeration and air conditioning sector of the engineering industry.</p> <p>People credited with this unit standard are able to, for commercial refrigeration and/or air conditioning systems, prepare for the installation; and install the components and complete documentation.</p>
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Classification	Mechanical Engineering > Refrigeration and Air Conditioning
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Available grade	Achieved
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Prerequisites	People undergoing training and assessment towards the competencies in this unit standard must be licensed by the Electrical Workers Registration Board as Electrical Service Technician.
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Guidance Information

- 1 Recommended skills and knowledge:
Unit 28959, *Demonstrate knowledge of installation and commissioning procedures for commercial RAC equipment*;
Unit 28963, *Install commercial RAC equipment under supervision*.
- 2 Legislation and standards
Health and Safety at Work Act 2015;
Building Act 2004;
Climate Change Response Act 2002;
Electricity (Safety) Regulations 2010;
Electricity Act 1992;
Electricity Amendment Act 1997;
Hazardous Substances and New Organisms Amendment Act 2015;
Ozone Layer Protection Act 1996;
AS/NZS 5149:2016 *Parts 1:5 Refrigerating Systems and Heat pumps – Safety and environment requirements*;
AS/NZS 817:2016 *Refrigerants – Designation and safety classification*;
AS/NZS 3000:2007 *Electrical installations (known as the Australian/New Zealand Wiring Rules)*;
and any subsequent amendments.

3 References

Althouse, Turnquist, Bracciano. *Modern Refrigeration and Air Conditioning*. 19th edition. Tinley Park, Illinois: The Goodhouse-Willcox Company Inc. ISBN 1-59070-280-8.

Institute of Refrigeration, Heating and Air Conditioning Engineers of New Zealand (IRHACE New Zealand). 2001 *Code of Practice for the reduction of emissions of fluorocarbon refrigerants in refrigeration and air conditioning applications*. Available from IRHACE, <http://www.irhace.org.nz/>.

- 4 All worksite practices must meet recognised codes of practice and documented safety procedures and safety plans (where these exceed the code) for personal and worksite safety, and obligations required under current legislation.

5 Definitions

Approved industry practices refer to approved codes of practice and standardised procedures accepted by the wider refrigeration and air conditioning industry sectors as examples of best practice.

Commercial refrigeration and air conditioning systems refer to refrigeration systems found in: retail food outlets, truck and shipping containers, horticultural cool stores, controlled atmosphere food stores; and air conditioning equipment used in commercial buildings.

EWRB refers to the Electrical Workers Registration Board.

Worksite procedures refer to documented 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, site safety procedures, equipment operating procedures, codes of practice, quality assurance procedures, housekeeping standards, procedures to comply with legislative and local body requirements.

6 Range

Competence is to be demonstrated on three occasions of installing commercial refrigeration and/or air conditioning systems. These systems may be any of: refrigeration; air conditioning; or combined refrigeration and air conditioning.

Outcomes and performance criteria

Outcome 1

Prepare for the installation of commercial refrigeration and/or air conditioning systems.

Performance criteria

- 1.1 Installation drawings, schedule of materials, and instructions are checked against site conditions, and confirmed or modified to suit site conditions in accordance with worksite procedures.

- 1.2 Timeframe for installation is established and agreed with stakeholders in accordance with approved industry practice.

Range stakeholders may include but are not limited to – manager, supervisor, contract manager, contractor, internal staff, building owner.

- 1.3 Materials are assembled and verified against schedule of materials.
- 1.4 Ancillary service connections are verified and timetabled in accordance with installation time schedule.
- Range may include but is not limited to – water, electricity, plumbing.
- 1.5 The ability to meet building code requirements for the installation is confirmed and, where required, permits and/or consents are identified and confirmed as suitable.

Outcome 2

Install the components of commercial refrigeration and/or air conditioning systems and complete documentation.

Performance criteria

- 2.1 Major components are positioned and secured in accordance with drawings, designs, specifications, and instructions.
- Range refrigeration components include but are not limited to – compressor, condenser, evaporator, metering device; air conditioning components include but are not limited to – outdoor compressor fan coil unit, indoor fan coil unit.
- 2.2 Supports and bracketing to secure pipework and any ductwork are positioned and fixed in accordance with drawings, designs, specifications, and instructions.
- 2.3 Refrigerant piping, tubing, condensate drain, and any ducting are run in accordance with drawings, designs, specifications, installation considerations, and instructions.
- Range installation considerations – nitrogen purging, internal cleanliness.
- 2.4 Thermal insulation is secured in accordance with drawings, designs, specifications, and instructions.
- 2.5 Ancillary components are installed in accordance with drawings, designs, specifications, and instructions.
- Range ancillary components may include but are not limited to – valves, controls, grilles, diffusers.
- 2.6 Integrity of building penetrations is confirmed by appropriate visual and tactile checks.
- 2.7 The work of associated tradespeople is identified and requested to enable project to proceed as scheduled in accordance with worksite procedures.
- 2.8 Installation is completed in accordance with agreed timeframe.

- 2.9 Documentation is produced in accordance with worksite procedures outlining labour and materials used.

Planned review date	31 December 2020
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 June 2006	31 December 2019
Review	2	18 June 2015	31 December 2020
Revision	3	16 February 2017	N/A
Revision	4	22 October 2020	N/A

Consent and Moderation Requirements (CMR) reference	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 if you wish to suggest changes to the content of this unit standard.