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

Purpose
This unit standard is for people who work in the refrigeration and air conditioning sector of the engineering industry.

People credited with this unit standard are able to, for commercial refrigeration and/or air conditioning systems:
- interpret system drawings and diagrams;
- diagnose faults and rectify common faults in systems;
- retrofit existing systems with alternative refrigerants;
- recondition components;
- and complete servicing activities and documentation, and recommission systems.

Classification
Mechanical Engineering > Refrigeration and Air Conditioning

Available grade
Achieved

Entry information

Recommended skills and knowledge
Recommended: unit standard: 28960 – *Demonstrate knowledge of commercial RAC system maintenance and servicing*;
Unit standard 28965 – *Maintain and service commercial RAC systems and equipment under supervision* or demonstrate equivalent knowledge and skills.

Explanatory notes

1 References
Health and Safety in Employment Act 1992;
Ozone Layer Protection Act 1996;
Building Act 2004;
Electricity Act 1992;
Hazardous Substances and New Organisms Act 1996;
Electricity (Safety) Regulations 2010;
AS/NZS 3000:2007, *Electrical installations known as the Australian/New Zealand Wiring Rules*;

2 Definitions
Commercial refrigeration and/or air conditioning systems refers to items such as: refrigeration equipment as found in retail food outlets, truck and shipping-container refrigeration, horticultural cool room refrigeration, controlled atmosphere fruit stores; and packaged or split air conditioning equipment as found in commercial buildings and computer rooms.

Worksite procedures – 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.

3 Range
Competence is to be demonstrated on servicing three systems. These systems may be any of: refrigeration; air conditioning; or combined refrigeration and air conditioning.

Outcomes and evidence requirements

Outcome 1
Interpret commercial refrigeration and/or air conditioning system drawings and diagrams.

Evidence requirements

1.1 Componentry is recognised and layout of systems is established from site drawings.

1.2 Correct sequence of system operation is determined from wiring diagrams and piping schematics.

1.3 Timeframes for servicing are 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.

Outcome 2
Diagnose faults in commercial refrigeration and/or air conditioning systems.
Evidence requirements

2.1 Faults are identified and diagnosed through information provided by users and/or operators, and the use of human senses.

Range human senses may include any of – sight, hearing, smell, touch.

2.2 Faults are identified and diagnosed through pressure drops, temperatures, and superheats.

2.3 Faults are identified and diagnosed through tests.

Range tests may include but are not limited to – electrical circuit’s continuity and mode, conductor and insulation resistance, componentry integrity, voltages, current draw, phase sequence.

Outcome 3

Rectify common faults in commercial refrigeration and/or air conditioning systems.

Evidence requirements

3.1 Isolating valves and evacuating connections are fitted as required by plant and operating environment.

3.2 Components in refrigeration and air conditioning systems are pumped-down and isolated in accordance with worksite procedures.

3.3 Faults are rectified in accordance with worksite procedures.

Range faults may include but are not limited to – electrical, mechanical, electronic, fluid.

3.4 Procedures are implemented to protect personnel, equipment, and property in accordance with worksite procedures.

Range may include but is not limited to – warning notices, identifications, equipment isolation, electrical isolation.

Outcome 4

Retrofit existing commercial refrigeration and/or air conditioning systems with alternative refrigerants.

Evidence requirements

4.1 Refrigerant is recovered and stored in accordance with worksite procedures.

4.2 Equipment and components’ suitability for retrofit is confirmed.

4.3 Unsuitable components are removed and replaced in accordance with worksite procedures.
4.4 Alternative refrigerants and their appropriate oils are selected and charged into existing systems in accordance with worksite procedures.

**Outcome 5**

Recondition components for commercial refrigeration and/or air conditioning systems.

**Evidence requirements**

5.1 Refrigeration and air conditioning components are reconditioned and overhauled in accordance with worksite procedures.

Range: compressors, pressure regulating valves, pumps, fans, motors.

**Outcome 6**

Complete servicing activities and documentation, and recommission systems.

**Evidence requirements**

6.1 Servicing activities are completed in accordance with agreed timeframes.

6.2 Where applicable, the integrity of building penetrations is confirmed by appropriate visual and tactile checks.

6.3 Relocated, repaired, and/or converted equipment and systems are reassembled, tested, and recommissioned to meet system specifications.

6.4 Manuals are updated to match current specifications.

6.5 Job content, materials, and labour inputs are described for both invoicing and customer reports in accordance with worksite procedures.

**Planned review date**

31 December 2020

**Status information and last date for assessment for superseded versions**

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Please note
Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard
Please contact Competenz at qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard