

Unit ID: 601

Domain

**AIR CONDITIONING AND
REFRIGERATION**

Title:

**Commission commercial and industrial
refrigeration systems**

Level: 4

Credits: 6

Purpose

This unit standard specifies the competencies required to commission commercial and industrial refrigeration systems. It includes verifying the integrity, performing pre-start checks and evacuating and charging industrial systems. This unit standard is intended for those who work as air conditioning and refrigeration mechanics.

Special Notes

1. Entry information:

Prerequisite

- Unit 567 - *Apply health and safety routines in an air conditioning and refrigeration workplace* or demonstrated equivalent knowledge and skills.

2. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which air conditioning and refrigeration operations are carried out.

3. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' specifications and/or company's guidelines and instructions

4. Glossary of terms:

- 'ACR' refers to air conditioning and refrigeration systems
- 'specifications' refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements
- 'commercial and industrial refrigeration' includes display cases, walk in and reach in coolers, freezer and ice machine.
- 'ancillary pipe work' refers to secondary pipe work such as water pipes.

5. Regulations and legislation relevant to this unit standard include the following:

- Labour Act, No. 6, 1992
 - Occupational Health and Safety Regulations No. 18, 1997
- and all subsequent amendments.

6. Performance of all elements in this unit standard must comply with industry standards.

7. This unit standard applies to single-phase and three-phase air conditioning and refrigeration systems.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website www.nta.com.na.

Elements and Performance Criteria

Element 1: Plan and prepare for work.

Range

Air conditioning and refrigeration service hand tools may include but are not limited to tools for turning, special spanners, swage and flare tools, tools for gripping and holding tools for hammering and driving, tools for cutting and forming, tools for pulling and pushing tools, measuring tools, bending tools and measuring instruments.

Air conditioning and refrigeration service power tools may include but are not limited to air blow gun, drill machine, arc welding machine, and grinder.

Equipment may include but are not limited to oxy-acetylene gas welding set, charging station or manifold gauges, recovery machine and vacuum pump.

Performance Criteria

- 1.1 Work instructions, including job cards, specifications and operational details are obtained, confirmed and applied.
- 1.2 Workplace inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements is carried out.
- 1.3 Safety requirements are followed in line with safety plans and policies.
- 1.4 Equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults rectified or reported prior to commencement.
- 1.5 Material requirements are identified and obtained in line with job card and/or specifications.
- 1.6 Materials are safely handled and located ready for use in line with workplace procedures.
- 1.7 Technical and/or calibration requirements for tools and equipment are sourced and implemented in line with workplace procedures.

- 1.8 Environmental protection requirements are identified and applied in line with environmental plans and regulatory obligations.

Element 2: Verify the integrity of commercial and industrial refrigeration systems.

Range

Commercial and industrial refrigeration systems may include but are not limited to cabinets, cold rooms, beverage cooling, cold plates, freezer rooms, ice making machines and food storage.

Performance Criteria

- 2.1 Systems are commissioned in line with manufactures and workplace procedures.
- 2.2 Systems are tested to specified pressures in line with workplace procedures.
- 2.3 System safety devices are tested and verified as safe to be exposed to operating pressures.
- 2.4 Ancillary pipe work is flushed, cleaned and verified for leak free in line with workplace procedures.

Element 3: Evacuate commercial and industrial refrigeration systems.

Performance Criteria

- 3.1 High level of vacuum is performed in line with workplace procedures.
- 3.2 Refrigerant is recovered and stored in line with workplace procedures.
- 3.3 Vacuums are broken with appropriate refrigerants prior to charging and in line with manufactures procedures.
- 3.4 System is re-charged with appropriate refrigerant and in line with manufacture's specifications.

Element 4: Perform pre-start checks on commercial and industrial refrigeration systems.

Performance Criteria

- 4.1 Controls are tested and set to meet performance in line with manufactures and workplace procedures.
- 4.2 Programmable controller input and outputs are tested and in line with manufactures specifications and workplace procedures.
- 4.3 Electrical systems are checked in line with workplace procedures.

- 4.4 Motor and pump rotation directions are verified in line with manufactures and workplace procedures.
- 4.5 Fluid flows are tested and verified.
- 4.6 Noise and vibration levels are checked in line with workplace procedures.
- 4.7 System performance data is recorded in line with operational specifications and workplace procedures.

Element 5: Complete work and clean up.

Range

Work completion details may include but are not limited to job cad and sign-out form for equipment.

Performance Criteria

- 5.1 Work is completed and appropriate personnel notified in line with workplace procedures.
- 5.2 Work area is cleared of waste, cleaned, restored and secured in line with workplace procedures.
- 5.3 Reusable material is collected and stored in line with workplace procedures.
- 5.4 Equipment used is cleaned, checked, maintained and stored in line with workplace procedures.
- 5.5 Work completion details are finalised in line with workplace procedures.

Registration Data

Subfield:	Mechanical Engineering
Date first registered:	27 May 2010
Date this version registered:	27 May 2010
Anticipated review:	2014
Body responsible for review:	Namibia Training Authority