

Unit ID: 590

Domain

**AIR CONDITIONING AND
REFRIGERATION**

Title:

Install air conditioning systems

Level: 3

Credits: 10

Purpose

This unit standard specifies the competencies required to install air conditioning systems. It includes installing indoor and outdoor air conditioning units, carrying out electrical wiring in air conditioners, and testing and starting up the air conditioning unit. 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:

- 'A/C' refers to air conditioning systems or air conditioning unit
- 'air conditioning' refers to the process of treating air so as to control simultaneously its temperature, humidity, cleanliness, and distribution within an interior space such as a room or building.

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

- Labour Act, No. 11, 2007
 - 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

Tools and equipment may include but are not limited to standard tools box, oxy-acetylene gas welding set, drill machine and swaging or flaring tool set, grinder machine, concrete blade, hammer, hack saw, spirit level, bending spring, pipe bender ,pipe cutter multimeter and square.

Materials may include but are not limited to drain pipe, fischer plugs, insulation tape poly filler, screws, bolt and nuts, tubes, armour flux, cable ties, soldering rods, trunking, couplings, saddle, polyvinyl chloride (PVC) glue, glands and solder flux.

Air conditioning (A/C) system may include but is not limited to cassette, split, window and ceiling type air conditioners.

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: Install indoor and outdoor air conditioning unit.

Performance Criteria

- 2.1 Procedures and information required for installing indoor and outdoor air conditioning unit are identified and sourced in line with workplace procedures.
- 2.2 Hand tools are identified and selected to match requirements of the task in line with workplace procedures.
- 2.3 Both indoor and outdoor unit position is determined and measured in line with the specified bracket from manufacturer, and level before drilling and/or installed.
- 2.4 A provision is made to make own bracket for an air conditioning unit (A/C) which comes with no specified bracket from the manufacturer using right procedures for cutting and arc welding,.

Element 3: Carry out electrical wiring in air conditioning units.

Range

Electrical wires may include but are not limited to two, four and/or six core cables.

Tools and material may include but are not limited to pliers, screw drivers, glands, saddle, insulation tape, crimping tool and lux.

Performance Criteria

- 3.1 Procedures and information required for carrying out electrical wiring in air conditioners are identified and sourced in line with workplace procedures.
- 3.2 Wiring is connected at the right points on both indoor and outdoor units and in line with manufacturer procedures and specifications.
- 3.3 Suitable circuit breakers are selected in line with the size of the A/C system.
- 3.4 Procedures are followed for electrical wire connections in line with manufacturers' specifications and workplace procedures.

Element 4: Test and start-up air conditioning unit.

Range

Inspection of air conditioner may include but are not limited to leak testing, vacuum, tighten electrical wires and open low and high pressure valve.

Tools and equipment may include but are not limited to charging station and/or manifold gauges, vacuum pump, allen keys, adjustable wrenches, refrigerant cylinder.

Performance Criteria

- 4.1 Procedures and information required for testing and starting-up air conditioning unit are identified and sourced in line with workplace procedures.
- 4.2 All electrical wires are tightened, and free from loose connections.
- 4.3 New installed pipes are pulled vacuum, charged with refrigerant and checked for leaks.
- 4.4 Both low and high pressure valves are opened before start up of a unit.
- 4.5 Visual inspections are carried out in line with workplace procedures.
- 4.6 Operational tests of the air conditioner are carried out.
- 4.7 Charging station and/or manifold gauge is removed and put back valve caps.

Element 5: Complete work and clean up.

Range

Work completion details may include but are not limited to job card 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

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