

## National Unit Specification: General Information

**UNIT** Plant Services - Compressed Air (Higher)

**NUMBER** D00L 12

### COURSE

### SUMMARY

The purpose of this unit is to develop a safe and systematic approach to the operation and maintenance of compressed air systems. The unit is written in general terms so that it can be applied to the range of compressed air plant covered in industry.

### OUTCOMES

- 1 Describe the operating principles and applications of compressed air plant.
- 2 Identify, trace and code compressed air service flow lines.
- 3 Describe procedures for monitoring, testing and adjusting compressed air plant.
- 4 State maintenance procedures for compressor air plant.

### RECOMMENDED ENTRY

Access to this unit is at the discretion of the centre. However, it may be beneficial if the candidate had completed the NC module:

2130036 Fundamentals of Technology Mechanical Systems.

### CREDIT VALUE

0.5 Credit at Higher.

### CORE SKILLS

Information on the automatic certification of any core skills in this unit is published in *Automatic Certification of Core Skills* in National Qualifications (SQA, 1999).

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## Administrative Information

**Superclass:** XH

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## **National unit specification: statement of standards**

**UNIT** Plant Services - Compressed Air (Higher)

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the unit specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

### **OUTCOME 1**

Describe the operating principles and applications of compressed air plant.

#### **Performance Criteria**

- a) The operating principles of compressed air plant are stated clearly.
- b) The function of each of the elements of a compressed air plant are described clearly.
- c) Appropriate applications for compressed air plant are stated correctly.

#### **Evidence Requirements**

Written and/or oral evidence of the candidate's ability to describe the function, purpose and operational requirements of a compressed air plant supplying a range of compressed air equipment.

### **OUTCOME 2**

Identify, trace and code compressed air service flow lines.

#### **Performance Criteria**

- a) The features of compressed air flowlines are stated correctly.
- b) A system of flowline colour coding is stated correctly for a specified compressed air system.

#### **Evidence Requirements**

Written and/or oral evidence of the candidate's ability to trace and code flowline details of a compressed air distribution system.

### **OUTCOME 3**

Describe procedures for monitoring, testing and adjusting compressed air plant.

#### **Performance Criteria**

- a) A monitoring/testing/adjustment procedure is described correctly for a compressed air plant with safe working practices.
- b) The testing/monitoring/adjustment procedure is correctly undertaken and the required data recorded accurately.
- c) The acquired data is correctly analysed and a test report is correctly compiled.

#### **Evidence Requirements**

Oral evidence of the candidate's ability to recognise the purpose of a test/monitoring programme and draw conclusions from the results. Written evidence of the candidate's ability to document a test/monitoring programme.

## **National unit specification: statement of standards (cont)**

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### **OUTCOME 4**

State maintenance procedures for compressor air plant

#### **Performance Criteria**

- a) Safety legislation and safe working practices are stated correctly.
- b) Safety hazards associated with the specified plant are described correctly.
- c) Tasks are undertaken in a logical manner.

#### **Evidence Requirements**

Oral evidence of the candidate's ability to comply with safety legislation and regulations.  
Performance evidence could be assessed by observation and recorded by a checklist.

Written evidence to demonstrate the candidate's ability to describe safety hazards associated with industrial plant.

## **National unit specification: support notes**

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This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

### **GUIDANCE ON CONTENT AND CONTEXT**

Corresponding to outcomes:

- 1        Applications of compressed air could include the following: air tools, process plant control, pneumatic equipment, pneumatic actuators. Types of compressor; reciprocating, screw and vane, single and multiple compressor installations. Ancillaries; aftercoolers, intercooler, air driers, air filters, receivers, centralised and decentralised installations.
- 2        Sizing of flowlines, pressure rating, pressure relief valves. Condensate traps, strainers, pressure reducing lubricators, isolation valves, test points, drain valves, schematics diagrams, isometric layout drawing. Attachment of flow/colour coding for instruments air, works air, drain lines, pressure relief lines, cooling water.
- 3        Operation and control of plant; effects of variables; testing and adjustment; design operating conditions, effect of operating outwith design conditions. No-load testing. Maintenance requirements.
- 4        Health and safety at work act; safety clothing, correct use of plant, correct use of tools, guarding of equipment. Safety permits. Emergency procedures. Legislation applicable to compressed air plant, pressure vessel regulations.

### **GUIDANCE ON TEACHING AND LEARNING APPROACHES**

Formal lecturing should be kept to a minimum, the candidates should be encouraged to research manufacturer's catalogues, audio-visual material and technical publications. Ideally candidates should have access to plant equipment, where this is not possible use should be made of industrial visits.

### **GUIDANCE ON APPROACHES TO ASSESSMENT**

Examples of Instruments of Assessment that could be used for each outcome are as follows.

Outcomes 1, 2 and 4

Structured question exercise to test ability in analysing compressed air plant systems.

or

The candidate could produce a report in a standard format, containing evidence of the work undertaken in completing assignments.

## **National unit specification: support notes (cont)**

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Outcome 3

As for outcomes 1, 2 and 4 but with the addition of a checklist kept by the tutor as evidence of candidates completing practical assignments successfully.

Advice on generating evidence

Candidates are encouraged to complete assignments and tasks in an independent manner.

Outcomes 1 and 4

The candidates could be set assignments or structured questions to investigate a compressed air system and to produce a brief report in a standard format.

Outcome 2

A diagram of a compressed air system could have the individual items identified and the flowlines correctly labelled and colour coded.

Outcome 3

The candidate could be expected to keep a record in the form of a report, of the work undertaken in recording data, interpreting data and using data to report on the operating condition of the equipment.

A lecturer checklist could be used to verify successful completion of practical exercises.

### **SPECIAL NEEDS**

This unit specification is intended to ensure that there are no artificial barriers to learning or assessment. Special needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments or considering alternative outcomes for units. For information on these, please refer to the SQA document *Guidance on Special Assessment and Certification Arrangements* (SQA, 1998).