

# Unit C24 Operate plant to maintain levels of heating and ventilation

## Introduction

### Summary

This unit is about operating air conditioning plant. The unit covers start-up and shut-down, routine maintenance and ensuring air quality and temperature are right for the types of activities which are taking place and the levels of facility usage. The unit does not cover the types of specialist maintenance which goes beyond the routine and should be carried out by trained and qualified engineers.

The unit is divided into three parts. The first part (page 2) gives some examples and explanations of some words we use in the unit. The second part (pages 3-5) describes the three things you have to do. These are:

- C24.1**      **Start up and shut down plant**
- C24.2**      **Maintain plant in working order**
- C24.3**      **Ensure the quality and temperature of air**

The third part (pages 6-7) describes the knowledge and understanding you must have.

### Target Group

The unit is intended mainly for Sport and Leisure Centre staff who have some responsibility for air conditioning plant operation. You should have had training and experience relevant to plant operation. The unit is not for engineers who carry out more than routine maintenance.

### Linked Units

This unit links to C25 and C26.

### Place in the NVQ/SVQ Framework

This unit is an option in the Operational Services level 2 NVQ/SVQ.

### Links to Key and Core Skills

*This unit will provide some evidence for the following QCA Key Skills:*

Communication 2.1a, 2.2, 2.3  
Application of Number 1.1, 1.2, 1.3  
Working with Others 2.1, 2.2, 2.3  
Problem Solving 2.1, 2.2, 2.3

*and the following SQA Core Skills:*

Communication Intermediate 1  
Numeracy Access 3  
Working with Others Intermediate 1  
Problem Solving Intermediate 1

# Unit C24 Operate plant to maintain levels of heating and ventilation

## What We Mean By Some of the Words Used in this unit

Contamination	<i>the air being polluted, for example by dust or smoke</i>
Corrective action	<i>what the candidate should do when there are faults, alarms or variations in the operation of the plant</i>
Emergency action plan	<i>the written plan which has been developed by the facility to deal with any emergencies which may occur</i>
Guidelines	<i>those developed by the manufacturer and possibly adapted by the facility</i>
Health and safety legislation	<i>mainly the Health and Safety at Work Act but also other pieces of legislation or regulations which may be relevant to the plant, for example the Control of Substances Hazardous to Health regulations</i>
Maintenance schedule	<i>the manufacturer's guidelines (possibly adapted by the facility) for routine maintenance</i>
Normal operating procedures	<i>the procedures which have been developed by the facility to cover normal (non-emergency) working</i>
Plant effectiveness	<i>the plant's ability to maintain water temperature and quality as required</i>
Plant efficiency	<i>the plant's ability to maintain air temperature and quality whilst using the minimum amount of energy under the circumstances</i>
Plant economy	<i>maintaining the overall plant running costs to an acceptable level</i>
Responsible colleague	<i>the person with overall responsibility for the plant and the quality of the air in the facility - usually the line manager or supervisor</i>

# Unit C24 Operate plant to maintain levels of heating and ventilation

## C24.1

### Start up and shut down plant

#### The National Standard

##### What you must do

*To meet the national standard, you must:*

1. make sure the **systems** are correctly set for start-up and shut-down
2. begin the start-up and shut-down sequences following the manufacturer's instructions
3. monitor the **systems** for faults and alarms
4. take the correct action to deal with any faults and alarms promptly and according to guidelines
5. follow the emergency action plan in the event of any emergencies
6. complete all the necessary **records** accurately and legibly, and make them available to the responsible colleague when required
7. follow all relevant legislation and other safety requirements at all times

##### What you must cover

*From your work you must show that you have set all of the following types of:*

##### a **systems**

- 1 heating
- 2 ventilation
- 3 air handling and conditioning
- 4 energy saving
- 5 measuring and control

*and maintained all of the following types of:*

##### b **records**

- 1 start up and shut down times
- 2 inlet and outlet pressures
- 3 air temperatures
- 4 results of chemical tests
- 5 variations from normal start-up and shut-down procedures
- 6 suggestions for improving normal operating procedures

# Unit C24 Operate plant to maintain levels of heating and ventilation

## C24.2

### Maintain plant in working order

#### The National Standard

##### What you must do

*To meet the national standard, you must:*

1. carry out regular tests, **checks, samples** and **routine maintenance** according to the prescribed maintenance schedule and log sheet requirements
2. identify any items which need repair and report these to the responsible colleague
3. take the appropriate action when the normal operating procedures are not being met
4. monitor the alarms and respond to them following normal operating procedures and the emergency action plan
5. complete all the necessary records and make them available to the responsible colleague when required
6. follow all relevant legislation and other safety requirements at all times

##### What you must cover

*From your work you must show that you have carried out all of the following types of:*

##### a checks and samples

- 1 rates of energy use
- 2 rates of flow
- 3 levels of pressure
- 4 levels of temperature
- 5 measuring and control
- 6 alarms
- 7 energy saving devices
- 8 dampers, louvers and drive belts
- 9 legionella and other water borne viruses

*and carried out all the following types of:*

##### b routine maintenance to ensure

1. plant efficiency
2. plant effectiveness
3. plant economy

# Unit C24 Operate plant to maintain levels of heating and ventilation

## C24.3

### Ensure the quality and temperature of air

#### The National Standard

##### What you must do

*To meet the national standard, you must:*

1. carry out the regular **tests, monitoring and sensory inspections** according to prescribed procedures
2. make sure that the air temperature and rates of circulation are appropriate for the activities taking place
3. carry out routine **maintenance procedures** according to the prescribed maintenance schedule
4. take corrective action when normal operating procedures are not being met and in response to bacteriological test results
5. complete all the necessary records accurately and legibly, and make them available to the responsible colleague when required
6. follow all relevant legislation and other safety requirements at all times

##### What you must cover

*From your work you must show that you have carried out all of the following types of:*

##### a tests and monitoring

- 1 temperature
- 2 humidity

*carried out all of the following types of:*

##### b sensory inspections

- 1 smell
- 2 contamination
- 3 condensation
- 4 physical comfort

*and carried out all of the following types of:*

##### c maintenance procedures

1. plant efficiency
2. plant effectiveness
3. plant economy

# Unit C24 Operate plant to maintain levels of heating and ventilation

## What you must know and understand

*To be competent in this unit, you must know and understand the following*

### For the whole unit

- K1 the manufacturer's instructions and the normal operating procedures for the plant
- K2 the emergency action plan for the plant
- K3 the records concerning the operation of the plant which need to be kept up
- K4 how to complete the necessary records
- K5 who is the responsible colleague to make records available to and report equipment needing repair
- K6 the basic requirements of the Health and Safety at Work Act and COSHH regulations as they apply to the operation of plant

### For C24.1 Start up and shut down the plant

- K7 the importance of following instructions for the operation of the plant
- K8 how to set the systems in preparation for start up and shut down
- K9 how to begin start up and shut down sequences
- K10 how to monitor the plant operation during start up and shut down
- K11 how to take corrective action when the normal operating procedures are not met during start up and shut down
- K12 the faults and alarms which may occur during start up and shut down

### For C24.2 Maintain plant in working order

- K13 the importance of maintaining plant in good working order
- K14 the requirements of the maintenance schedule and logsheets
- K15 normal rates of energy use and flow, levels of pressure and temperature
- K16 how to carry out the routine tests and maintenance required
- K17 how to identify items needing repair and what to do when they are found
- K18 how to identify when the plant is not running properly
- K19 how to test alarms

# Unit C24 Operate plant to maintain levels of heating and ventilation

## For C24.3 Maintain the quality and temperature of air

- K20 the importance of maintaining the quality and temperature of the air
- K21 the tests and checks which need to be carried out in order to check the quality and temperature of the air and how to do so
- K22 the air temperatures and rates of circulation which are appropriate to the range of activities and levels of facility usage
- K23 the types of corrective action to take when air quality and temperature does not meet standards