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## Overview

This standard is for people who service and maintain industrial and commercial heating and ventilating systems.

The person performing this work must be able to comply with the correct procedures and practices for servicing and maintaining industrial and commercial heating and ventilating systems. This work must be in accordance with the current versions of the appropriate industry standards and regulations; the specification; industry recognised working practices; the working environment and the natural environment. They must know and understand the operation, types, and application of the following systems:

### Pipework

- hot water
- hot water heating
- cold water
- chilled water
- compressed air
- fire protection
- steam

and/or

### Ductwork

- supply, extract and re-circulation
- local exhaust ventilation
- low, medium and high-pressure air
- fire protection
- kitchen extract

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## Performance criteria

### You must be able to:

1. verify that the job information and documentation are current and relevant and that the plant, instruments, access equipment and tools are fit for purpose
2. produce a risk assessment and method statement in accordance with organisational procedures for the work to be carried out, including the identification and use of personal protective equipment
3. confirm before work starts that the work location and work area can be accessed safely and has been checked for the risk to other personnel on the site, and take appropriate action if a risk is present
4. select materials, equipment, accessories and components needed to complete the service and/or maintenance activity and confirm that they are:
  - of the right type and size
  - fit for purpose in accordance with the system's design
  - suitable for the working environment
5. interpret diagrams and drawings to identify the location of the system's associated equipment, accessories and components that need servicing and/or maintaining
6. complete safe-isolation to ensure the safe disconnection,
7. installation and/or connection of electrical equipment, cables/wiring,
8. associated with the system
9. service and/or maintain the system and its associated equipment, accessories and components in accordance with:
  - the system's design
  - the working environment
  - manufacturers' instructions
10. replace and/or repair the system's associated equipment, accessories and component
11. perform appropriate testing to confirm the integrity of the system and its associated equipment, accessories and components on completion of the service and/or maintenance activity
12. commission the associated equipment, components and accessories,

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13. adjusting safely and effectively the control features in accordance with:
    - the system's design
    - the working environment
    - manufacturers' instructions
  14. confirm with the relevant people:
    - those necessary variations to the planned programme of work
    - the actions to be taken to ensure that any variations to the planned programme of work minimise the potential for hazard and risk
  15. obtain customer/client acceptance of the serviced and/or maintained system and its associated equipment, accessories and components in accordance with organisational procedures
  16. implement organisational procedures for the safe transport and/or disposal of any waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions complete relevant documentation in accordance with organisational procedures

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## Knowledge and understanding

### You need to know and understand:

1. the operation, applications, advantages and limitations of different systems and their associated equipment, components and accessories in relation to:
  - the system's design
  - the working environment
2. the appropriate industry standards and regulations relevant to servicing and maintaining industrial heating and ventilating systems
3. how to verify that job information and documentation is current and relevant and that the plant, instruments, access equipment and tools are fit for purpose
4. how to produce a risk assessment and method statement for the work to be performed, including the identification and use of personal protective equipment, in accordance with:
  - the system's design
  - the conditions of the working environment
  - organisational procedures
  - activities of other personnel on site
5. how to select materials, equipment, accessories and components needed to complete the service and/or maintenance activity and confirm that they are:
  - of the right type and size
  - fit for purpose in accordance with the system's design
  - suitable for the working environment
6. how to interpret diagrams and drawings to identify the location of the system's associated equipment, accessories and components that need servicing and/or maintaining
7. the correct procedures for safe-isolation of electrical supplies
8. the methods and techniques for servicing and/or maintaining the system and its associated equipment, accessories and components in accordance with:
  - the system's design
  - manufacturers' instructions
9. the methods and techniques for replacing and/or repairing the system's associated equipment, accessories and components in accordance with:
  - the system's design
  - manufacturers' instructions
  - using appropriate jointing methods

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10. how to implement organisational procedures for the safe transport and/or disposal of any waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions
  11. the methods, techniques and procedures used to perform appropriate testing to confirm the integrity of the system and its associated equipment, accessories and components on completion of the service and/or maintenance activity
  12. the organisational procedures for:
    - confirming with relevant people those necessary variations to the planned programme of work that may have the potential to introduce a hazard and/or impact on the service and/or maintenance work to be undertaken
    - confirming with relevant people the correct actions to be taken to ensure that any variations to the planned programme of work will not introduce a hazard and have minimum impact on the service and/or maintenance work to be undertaken
    - obtaining customer/client acceptance of the serviced and/or maintained system and its associated equipment, accessories and components
    - completing all relevant documentation

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## Scope/range related to performance criteria

### **Working Environment (Internal and/or External)**

- commercial
- industrial
  - agricultural
  - horticultural
  - leisure and entertainment
  - residential medical and care facilities
  - public services establishments
  - pre-1919 traditional/historic buildings

### **Site services**

- electricity
- water
- gas
- oil

### **Systems**

#### Industrial and commercial heating and ventilating ductwork

- supply, extract and re-circulation
- local exhaust ventilation
- low, medium and high-pressure air
- fire protection
- kitchen extract

#### Industrial and commercial heating and ventilating pipework

- hot water – open vented/indirect/secondary circulation/instantaneous
- hot water heating (low, medium and high temperature)
- cold water – storage/none storage
- chilled water systems – air conditioning, refrigeration, heat rejection
- warm air
- compressed air
- fire protection
- steam

### **Equipment, components and accessories**

- air handling units
- fans

- dampers
- access doors
- terminal units
- laboratory fume cupboards
- storage cabinets
- ventilation hoods
- filters
- humidifiers
- metal and flexible ductwork
- measuring instruments
- fuel-fired boilers (gas; oil; solid fuel)
- water storage vessels
- water heaters
- pumps
- heat emitters and exchangers
- burners
- flues
- cisterns
- refrigeration plant
- air conditioning plant
- calorifiers
- valves
- compressors
- receivers
- filters
- pressure vessels
- sprinkler heads
- traps and strainers
- measuring instruments
- environmental technology equipment
- prefabricated modules

**Plant**

- generators
- transformers for low voltage hand-tools
- lifting equipment
- access equipment\* \*

**Site**

- new build construction – building or structure
- existing building or structure

**Organisational Procedures**

- information management
- project management

- risk assessment management
- implementing and monitoring health & safety requirements and issues
- implementing and monitoring issues relating to the natural environment
- customer service
- accident reporting
- emergencies
- communication with relevant people

**Relevant people**

- customers/clients
- client representatives
- supervisors
- site/contract manager
- other contractors/trades
- members of the public
- work colleagues

**Appropriate testing**

- pressure
- system hygiene and charging
- performance tests

**Jointing methods**

- compression
- threaded/grooved
- flanges
- welding
- brazing
- adhesives



BSEHV09

Service and maintain industrial and commercial heating and ventilating systems



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