

Service and maintain air conditioning and heat pump systems

Overview

This standard is for people who service and maintain air conditioning and heat pump systems.

The person performing this work must be able to comply with the correct procedures and practices for servicing & maintaining air conditioning & heat pump 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 types, operation, operating principles and/or applications of:

- systems (unitary/package; split/multisplit; complex)
- heat pumps
- system components
- air handling units

Service and maintain air conditioning and heat pump systems

Performance criteria

You must be able to:

1. verify that the job and system information and documentation are current and relevant and that the plant, instruments, access equipment and tools are fit for purpose
2. confirm before work starts that the work location and work area can be accessed safely
3. interpret system information, diagrams and drawings to identify the location of the equipment, accessories and components that need servicing and/or maintaining
4. select materials, equipment, components and accessories 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 design
 - suitable for the working environment
5. produce a risk assessment and method statement for the work to be performed, including the identification and use of personal protective equipment
6. complete safe-isolation to ensure the safe disconnection, installation and/or connection of electrical equipment, cables/wiring, associated with the system
7. service and/or maintenance of the system and its associated equipment, accessories and components in accordance with:
 - the system's design
 - the working environment
 - manufacturers' instructions
8. remove, replace and/or repair the system's associated equipment, accessories and components
9. confirm the integrity of the system and its associated equipment, accessories and components on completion of the service and/or maintenance activity
10. 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 will minimise the potential for hazard

Service and maintain air conditioning and heat pump systems

and risk

11. obtain customer/client acceptance of the serviced and/or maintained system and its associated equipment, accessories and components in accordance with organisational procedures
12. implement organisational procedures for the safe transport and/or disposal of waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions
13. complete relevant documentation in accordance with organisational procedures

Service and maintain air conditioning and heat pump systems

Knowledge and understanding

You need to know and understand:

1. the applications, operations and operating principles, advantages and limitations of different systems
2. the appropriate industry standards and regulations relevant to servicing and maintaining air conditioning and heat pump 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 for the system to identify the location of the equipment, accessories and components that need servicing and/or maintaining
7. the correct procedures for safe-isolation of electrical supplies to equipment, cables/wiring associated with the system
8. the methods and techniques for servicing and/or maintaining the equipment, components and accessories in accordance with:
 - the system's design
 - the working environment
 - manufacturers' instructions
9. the methods and techniques for removing, replacing and/or repairing the system's associated equipment, accessories and components in accordance with:
 - the system's design

Service and maintain air conditioning and heat pump systems

- the working environment
 - manufacturers' instructions
 - appropriate jointing methods
10. the methods, techniques and procedures to confirm the integrity of the system and its associated equipment, accessories and components on completion of the service and/or maintenance activity
11. the methods and techniques for confirming that the system provides cooling and/or heating by measuring air flow temperature difference across relevant key points to determine whether it meets the design specification
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
13. 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
14. how to complete relevant documentation in accordance with organisational procedures

Service and maintain air conditioning and heat pump systems

Scope/range related to performance criteria

Working environments (internal and/or external)

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

Systems

- unitary or package
- split or multisplit
- complex

Equipment, components and accessories

- heat pumps
- condensers
- evaporators
- compressors
- expansion devices
- accumulators
- filters
- controls for pressure/temperature (including complex/smart)
- line and regulating valves
- sensors and gauges
- vacuum pumps
- condensate pumps
- grilles/diffusers/fans/filters
- heat exchangers
- air handling units
- liquid receivers

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

Service and maintain air conditioning and heat pump systems

- accident reporting
- emergencies
- communication with relevant people

Joining methods

- compression
- threaded
- grooved
- flanges
- soft soldering
- adhesives
- brazing
- welding

Plant

- transformers for low voltage hand-tools
- lifting equipment
- access equipment
- hot work equipment* *

Relevant people

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

Glossary

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