

Install refrigeration systems

Overview

This standard is for people who install refrigeration systems.

The person performing this work must be able to comply with the correct procedures and practices for installing refrigeration 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 safe handling practices and the types, operation, operating principles and/or application of:

- refrigerants (including their properties e.g. flammable/non-flammable)
- direct and indirect systems
- system components
- RAC and HP systems

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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. confirm that the site services are compatible with the system's design
4. 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
5. check that equipment, components and accessories are:
 - of the right type and size
 - fit for purpose in accordance with the system's design
 - suitable for the working environment in which they are to be installed
6. determine at the outset, that the plans for positioning and fixing the equipment, components and accessories are in accordance with:
 - the system's design
 - the working environment
 - manufacturer instructions
7. comply with industry practices and organisational procedures to ensure the co-ordination of site services and the activities of other trades
8. measure and mark out locations for fitting and fixing the equipment, components and accessories in accordance with:
 - the system's design
 - manufacturer instructions
9. fit, fix and connect the selected equipment, components and accessories, using suitable jointing methods in accordance with:
 - the system's design
 - the working environment
 - manufacturer instructions
10. confirm with the relevant people:
 - those necessary variations to the planned programme of work

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- the actions to be taken to ensure that any variations to the planned programme of work will minimise the potential for hazard and risk
- 11. implement organisational procedures for the safe transport and/or disposal of waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions

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Knowledge and understanding

You need to know and understand:

1. the applications, operation and operating principles, advantages and limitations of different systems and their impact on Global Warming Potential
2. the applications, operation advantages and limitations of equipment, components and accessories in relation to the working environment
3. the applications, advantages and limitations of different refrigerants their properties and methods for safe usage
4. the appropriate industry standards and regulations relevant to installing refrigeration systems
5. how to verify that job and system information and documentation is current and relevant and that the plant, instruments, *access equipment* and tools are fit for purpose
6. how to produce a risk assessment and method statement for the work to be carried out, 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
7. how to check that the identified equipment, components and accessories for the system are
 - of the right type and size
 - fit for purpose in accordance with the system's design
 - suitable for the working environment in which they are to be installed
8. how to interpret diagrams and drawings of the system to identify the planned location of the equipment, components and accessories to be installed
9. the methods, techniques and jointing methods for fitting, fixing and connecting the equipment, components and accessories in accordance with:
 - the system's design
 - the working environment
 - manufacturer instructions
10. the organisational procedures for confirming with the relevant people the appropriate actions to be taken to ensure that any variations to the planned programme

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of work will not introduce a hazard and have minimum negative impact on the installation work to be undertaken

11. the methods for the safe transport and/or disposal of waste material, substances and liquids in accordance with suppliers' and manufacturers' instructions

BSERAC04

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Scope/range

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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

- vapour compression
- secondary
- multi-temp
- air conditioning and heat pumps
- compound/pumped

Equipment, components and accessories

- compressors
- condensers/evaporators
- heat exchangers
- pressure vessels
- liquid drier/receivers
- valves (line; regulating)
- pipework
- controls for pressure/temperature (including complex/smart)
- sensors and gauges
- internal and external units
- heat pumps
- grills/diffusers/fans/filters
- vacuum/condensate pumps

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

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- 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

Refrigerants

- HC
- HFC (HFO)
- CFC
- natural inorganic (including CO₂ and ammonia)
- secondary refrigerants

Relevant people

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

Glossary

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