

Overview

This standard is about locating and inspecting refrigeration equipment. The aim of the inspection is to assess the efficiency and sizing of the system compared to the cooling requirements of the building. In turn, this will enable the production of a report, which advises customers on issues that affect energy efficiency and the use of installed air conditioning systems and suggest potential improvements.

The standard is about reviewing existing information relating to the refrigeration system, and its maintenance and energy consumption. It is also about conducting a thorough inspection of the system including the visual inspection of all relevant aspects in accordance with industry requirements.

This standard also covers the production of records of findings using relevant methods and ensuring that records are kept in accordance with the relevant data protection legislation.

Locate and inspect refrigeration equipment

Performance criteria

You must be able to: **Review and record information relating to the energy performance of refrigeration equipment**

1. review the available information and identify that which is relevant to the energy performance of the refrigeration equipment
2. assess the installed equipment, controls, building fabric and layout
3. identify variations from available drawings, documents and records and evaluate the impact they have on energy performance
4. review the relevant site information and identify significant factors that influence the conduct of the energy assessment
5. locate the refrigeration equipment and assemble a minimum portfolio of relevant documentation if required
6. maintain records of your inspections in accordance with organisational requirements and the relevant data protection legislation

Locate and inspect refrigeration equipment

1. locate relevant refrigerant compressors and confirm that these can be brought into operation
2. note the general state of the refrigerant equipment and the space immediately around it checking for signs of oil/refrigerant leakage
3. observe the temperature difference across the refrigeration compressor using surface temperature probes
4. observe visible liquid sight glass on liquid line and on flooded evaporators during plan operation to record the condition of refrigerant problems
5. compare refrigerant temperature and/or pressure gauge readings with expected temperature and pressures for the current indoor and outdoor temperatures to check for condenser blockage or undersize and sufficiency of refrigerant
6. check water chillers to confirm that water flow rates are available through the condensers and evaporators according to design or commissioning data
7. check that water pressure drops across the condensers and evaporators are in accordance with the design or commissioning data

Conduct the inspection

1. provide evidence of your identity to those present at the property before commencing the inspection
2. confirm the availability of the equipment and resources required for the inspection
3. use test equipment according to manufacturers' instructions
4. identify circumstances when at the property that prevent you from continuing with the inspection and explain the reasons to the customer
5. undertake specific, non-invasive and non-hazardous techniques that have been included within the agreed scope of works
6. observe and take measurements which are necessary to provide data for assessment of the energy performance of the air conditioning system
7. make further investigations where observations are inconsistent with existing evidence and expected findings
8. draw the customer's attention to inadequate maintenance or neglect, particularly where these might have implications for the health and safety of occupants or the public

Locate and inspect refrigeration equipment

Knowledge and understanding

You need to know and understand:

1. the relevant components and controls of refrigeration equipment
2. the design and operation of the installed refrigeration equipment, and the impact of changes in building usage on the air conditioning system installed
3. how to identify the type, features and location of the air conditioning systems present at the property
4. how to check that the system settings are within the limits set by manufacturer's data or design intent
5. how to read and interpret building drawings
6. factors affecting air conditioning systems' efficiency
7. the potential impact of the phasing out of ozone depleting refrigerants including the types of refrigerants and their global warming potential (GWP) and total equivalent warming impact (TEWI)
8. the range of information available relating to the air conditioning system installed, its maintenance schedule and energy consumption
9. how to review available information to identify that which is relevant to the energy performance of the air conditioning system
10. how to review the available information to identify factors that influence the energy assessment
11. how to identify circumstances that prevent the assessment of the energy performance of the air conditioning system
12. the types of equipment and resources that are required for the inspection
13. how to undertake specific, non-invasive and non-hazardous techniques included within the agreed scope of works
14. how to make further investigations where observations are inconsistent with existing evidence and expected findings
15. the requirements and application of relevant regulations, standards and guidance that apply to the assessment of the energy performance of air conditioning systems
16. how to collate information required to assess the energy performance of air conditioning systems
17. the types of advice that can be provided to customers during inspection
18. the sources of information and advice about energy performance

- to which customers can be referred
19. how to record the information and evidence in accordance with the relevant data protection legislation

Scope/range

Physical measurements of performance:

- estimate current cooling loads against appropriate optimum cooling loads for a typical building of the type being inspected
- establish the optimum size of the cooling system
- identify special cooling measures for specific areas
- assess cooling capacity using equipment rating plates and performance data available from manufacturers and online databases based on size and likely age of the equipment
- establish the ventilation rate in terms of volume of air being circulated through the building and prescribed ventilation rates in regulatory documentation and professional guidance
- determine airflow rates provided by fans in relation to ventilation requirements of the building and fan duties available from building logbooks, operational and maintenance manuals and rating plates and the total power required by supply and extract fans
- establish the specific fan power of the supply and extract installation from available information compared to recommended levels in guidance documents

Locate and inspect refrigeration equipment

Developed by	Instructus
Version Number	1
Date Approved	March 2019
Indicative Review Date	January 2024
Validity	Current
Status	Original
Originating Organisation	Instructus
Original URN	ASTACEA4
Relevant Occupations	Architects; Professional Occupations; Engineering Professionals; Engineering; Construction, planning and the built environment; Building and construction; Town Planners and Surveyors
Suite	Air Conditioning Energy Assessment
Keywords	complex; central; air conditioning systems; maintenance; energy consumption; efficiency; inspection