INSACEA7

Locate and inspect airborne cooling and air conditioning systems in air handling units and associated ductwork

Overview

This standard is about locating and inspecting airborne cooling and air conditioning systems in air handling units and associated ductwork. The aim of the inspection is to assess the efficiency and sizing of the systems 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 airborne cooling and air conditioning systems, and their maintenance and energy consumption. It is also about conducting a thorough inspection of the systems 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.

Performance criteria

You must be able to:

Review and record information relating to the energy performance of airborne cooling and air conditioning systems in air handling units and associated ductwork

1. review the available information and identify that which is relevant to the energy performance of the airborne cooling and air conditioning systems
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 airborne cooling and air conditioning systems 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 airborne cooling and air conditioning systems in air handling units and associated ductwork

1. arrange for air handling fans and air distribution systems to be turned off prior to inspection
2. note usual filter changing and cleaning frequency and elapsed time since the last change or clean for compliance following manufacturers' requirements
3. measure filter resistance where differential filter gauges are inoperable
4. observe the filter condition and check the fit and sealing of the filter and housing within the duct
5. assess the condition of heat exchangers for damage, blockage and debris
6. measure the air path resistance across the coil and compare this with design resistance information
7. check refrigeration heat exchangers for signs of leakage of refrigerant
8. note the fan type and method of control in your inspection records
9. check the functioning of any energy conservation facilities such as heat recovery
10. check the air handling plant and visible air containment including ductwork,

floor or ceiling plenums and builders' work shafts for signs of excessive leakage
11. note the setting and functioning of any dampers that modulate the proportions of fresh and recirculated air

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 manufacturer's 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 airborne cooling and air conditioning systems
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

Knowledge and understanding

You need to know and understand:

1. the relevant components and controls of airborne cooling and air conditioning systems
2. the design and operation of the installed airborne cooling and air conditioning systems, 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 airborne cooling and 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. the factors affecting air conditioning systems efficiency
7. the range of information that available relating to the airborne cooling and air conditioning system installed, its maintenance schedule and energy consumption
8. how to review available information to identify that which is relevant to the energy performance of the air conditioning system
9. how to review the available information to identify factors that influence the energy assessment
10. how to identify circumstances that prevent the assessment of the energy performance of the air conditioning system
11. the types of equipment and resources that are required for the inspection
12. how to undertake specific, non-invasive and non-hazardous techniques included within the agreed scope of works
13. how to make further investigations where observations are inconsistent with existing evidence and expected findings
14. the requirements and application of relevant regulations, standards and guidance that apply to the assessment of the energy performance of air conditioning systems
15. how to collate information required to assess the energy performance of air conditioning systems
16. the types of advice that can be provided to customers during inspection

17. the sources of information and advice about energy performance to which customers can be referred
18. 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

INSACEA7

Locate and inspect airborne cooling and air conditioning systems in air handling units and associated ductwork

Developed by	Skills CFA
Version Number	1
Date Approved	30 Mar 2019
Indicative Review Date	06 Jan 2024
Validity	Current
Status	Original
Originating Organisation	Instructus
Original URN	ASTACEA4
Relevant Occupations	Architects, Town Planners and Surveyors, Building and Construction, Construction, Planning and the Built Environment, Engineering, Engineering Professionals, Professional Occupations
Suite	Air Conditioning Energy Assessment
Keywords	complex; central; air conditioning systems; maintenance; energy consumption; efficiency; inspection