INSACEA2

Inspect simple or packaged air conditioning systems

Overview

This standard covers the competences required to inspect simple or packaged air conditioning systems as defined by the Chartered Institute of Building Services Engineers (CIBSE). The competences would be applied where cooling is provided in conditioned spaces using indoor units that contain refrigerant to air heat exchangers and an integral air circulation fan. These may be either integral with outdoor units that contain the refrigerant compressor, refrigerant to outdoor air heat exchanger or circulation fan including distribution ductwork or connected to the outdoor unit by refrigerant pipework.

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

Performance criteria

You must be able to:

Review and record information relating to the energy performance of simple or packaged air conditioning systems

1. review available information and identify that which is relevant to the energy performance of the simple or packaged **air conditioning system
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 the factors that influence the conduct of the energy assessment
5. locate the relevant 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 the condition of outdoor units

1. note, within your records, the general state of the equipment and the space immediately around it checking particularly for signs of oil or refrigerant leakage
2. check for adequate airflow to and from the equipment and the potential for warmed air from outdoor unit(s) to be drawn into the building in accordance with manufacturer's instructions
3. check and record the temperature of refrigerant vapour entering the compressor to ensure it complies with design requirements
4. check for warm air recirculation degrading outdoor unit efficiency

Locate and inspect the condition and operation of indoor units within treated areas

1. assess the condition of heat exchangers for damage or blockages
2. check the presence and condition of air filters and filter changing and cleaning frequency for compliance with manufacturers' requirements
3. check facilities manager's complaints log for evidence of linked to ventilation problems
4. check and record temperature across fan coil unit to confirm it is in line with design requirements

Locate and examine the controls responsible for the operation of the cooling units, the heating system controls and their associated temperature sensors

1. assess the positioning of cooling sensors in relation to factors such as local levels of internal gain, orientation, windows and draughts, exposure to solar radiation and seasonal differences
2. observe control timers and note in your records, the current indicated weekday and time of day against the actual time
3. note, in your records, the means of inhibiting the simultaneous operation of the heating and cooling equipment in the same location
4. note the control arrangements for cooling units installed in spaces with opening windows and whether any physical interlock or staff instructions are in place to prevent it
5. assess the efficiency of the equipment based on observations, checking the equipment rating plate(s) and, where required, making physical measurements of performance

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. identify circumstances when at the property that prevent you from continuing with the inspection and explain the reasons to the customer
4. observe and take measurements which are required to provide data for the assessment of the energy performance of the air conditioning system
5. make further investigations where observations are inconsistent with existing evidence and expected findings
6. 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:

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1. the relevant principles and theory of how an air conditioning system works
2. the relevant components and controls of air conditioning systems and their interrelationship
3. the design intent of the specific installed air conditioning system, and the impact of changes in building usage on the air conditioning system installed
4. how to identify the type, features and location of the air conditioning system present at the property
5. how to check that the system settings are within the limits set by the manufacturer's instructions
6. how to read and interpret building drawings
7. the factors affecting air conditioning systems
8. the system installed, its maintenance records and energy consumption
9. the type of action to take in cases where information is not available
10. how to review the available information to identify what is relevant to the energy performance of the air conditioning system
11. how to review the available information to identify factors that influence the energy assessment
12. how to identify circumstances that prevent the assessment of the energy performance of the air conditioning system
13. the types of equipment and resources that are required for the inspection
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 identify potential risk areas in waterborne cooling systems where Legionella could be present and how to take action to protect self and customers
17. how to collate information required to assess the energy performance of air conditioning systems
18. the types of advice that can be provided to customers during inspection
19. the sources of information and advice about energy performance to which customers can be referred

20. 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

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